APPENDIX A DATA VALIDATION REPORTS



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 8, 2016

SUBJECT: Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on February 16, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #35878:

SDG#

Fraction

AUK1, AUL1

Polychlorinated Biphenyls, Metals, Wet Chemistry

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area, September 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Method Data Review, October 1999
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 11, 2016

SUBJECT: Revised Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed are the revised validation reports for the fraction listed below. Please replace the previously submitted reports with the enclosed revised reports.

LDC Project #35878:

SDG#

Fraction

AUK1, AUL1

Polychlorinated Biphenyls

• Added the field duplicate comparison.

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 21, 2016

SUBJECT: Revised Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed are the revised validation reports for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

LDC Project #35878:

SDG # Fraction

AUK1 Wet Chemistry

 Added Moisture Content by ASTM D2216 and removed the TOC triplicate qualifier (QC was within criteria).

Wet Chemistry

AUL1

• Added Moisture Content by ASTM D2216.

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist

	EDD Stag	e 2B		LD	C #	<i>‡</i> 35	878	(A	ncl	or	En	vir	onn	nen	tal	-Se	att	e V	VA	/ Jo	org	ens	sen	Fo	rge	E/	4A)										
LDC	SDG#	DATE REC'D	(3) DATE DUE	PC (808	:Bs 82A)	(60	tals 20A 71A)	Si	ain ze EP)	Sp Gra (D8	vity	TC (Plu	C mb)	To Sol (254	ids						:									:						ı	
Matrix	: Water/Soil			w	s	w	s	w	s	w	S	w	s	W	s	w	s	W	s	W	s	w	s	W	s	w	s	w	s	w	s	w	s	W	s	w	s
Α	AUK1	02/16/16	03/08/16	0	_	0	13	0	13	0	13	0	13		13																						
В	AUL1	02/16/16	03/08/16	0	15	0	15	0	15	0	15	0	15	0	15																						
					<u> </u>	<u> </u>			ļ													_									L						<u> </u>
		<u> </u>			1	<u> </u>				<u> </u>											ļ			<u> </u>												\square	
					<u> </u>	<u> </u>		 		<u> </u>	<u> </u>				_						<u> </u>			<u> </u>				<u> </u>		_	<u> </u>						<u> </u>
	71.11	 		<u> </u>	-	├-			<u> </u>	<u> </u>		-	 														<u> </u>		<u>.</u>		_						<u> </u>
$\vdash \vdash$		-		-	ļ	┼	-	\vdash	 	├-	<u> </u>		<u> </u>								_	_	<u> </u>	ļ					<u> </u>	_	<u> </u>					,	<u>—</u>
\vdash		 		-	-	╀	<u> </u>	<u> </u>		-			<u> </u>										<u> </u>							_		_		-		\square	_
				-	├	-	-	-	├-	├—	_		┞							_	_	-	<u> </u>	<u> </u>						-	<u> </u>					\square	 -
		+	 -	╁	╁	┢	┢			├		┢	<u> </u>								_	 -			-						├-					\longrightarrow	
			 	-	╁	\vdash	\vdash	-	\vdash	├		├								<u> </u>	 	<u> </u>					<u> </u>	-		-	-						
		 	 		┢	╁	├		┝	├		-	├				-				 	 	<u> </u>								├			-			
\vdash		+		\vdash	\vdash	┼─	\vdash		 -	╁╴	-	╁	\vdash		-		-			┝	-	\vdash	 	-		_		-		<u> </u>	-	 					
\vdash				Ì		╁╌			 	┢╴		-										╁						-	\vdash	-	\vdash			Н	\dashv	$\overline{}$	\vdash
\vdash						\vdash				 												<u> </u>						_			<u> </u>						\vdash
		-		1		十	H	†		┢		t									_		-						-						_		
				┢	 	T	İ		T									\vdash													<u> </u>				\neg		Π
										<u> </u>	<u> </u>											1		<u> </u>				ÌТ			<u> </u>						Г
																																					Γ
																																					Γ
										L																											
										<u>L</u>							L																			Ш	
		<u> </u>		_	<u> </u>	<u> </u>			<u> </u>	<u> </u>		<u> </u>	<u> </u>						<u> </u>			<u> </u>			ļ			<u> </u>			<u> </u>					oxdot	L
		ļ	ļ	_	<u> </u>	<u> </u>	<u> </u>			L	_	<u> </u>		_		<u> </u>						_		<u>L</u>				<u> </u>	_		<u> </u>		_			Ш	_
\sqcup		1	 		-	<u> </u>	<u> </u>		<u> </u>	 	<u> </u>	_	├		_	<u> </u>	_		_			_	<u> </u>	 	<u> </u>	_	1_	 	<u> </u>	_	igspace					\sqcup	\vdash
\sqcup		<u> </u>		<u> </u>	1	igspace	_	<u> </u>	_	<u> </u>	<u> </u>										_			<u> </u>	<u> </u>			<u> </u>	<u> </u>		<u> </u>		<u> </u>			\sqcup	L
$\vdash \vdash$		-	ļ	<u> </u>	╀	\vdash	\vdash	_	_	-	\vdash	-	<u> </u>	<u> </u>	<u> </u>	<u> </u>	ļ	<u> </u>				_	<u> </u>	<u> </u>	├		 	-	┡	<u> </u>	 -						\vdash
\vdash		 		┼	╁	igapha	-	ļ	₩	├-	 	_	_	ļ			_				<u> </u>	1	_		_				<u> </u>	_	┢	_				\square	_
Total	A/CR	<u></u>	<u></u>	0	32	0	28	0	28	0	28	0	28	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17:

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 11, 2016

Parameters:

Polychlorinated Biphenyls

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUK1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-PMU-6-0-2cm-160119	AUK1A	Sediment	01/19/16
JF-PMU-6-0-10cm-160119	AUK1B	Sediment	01/19/16
JF-PMU-6-0-10cm-160119DL	AUK1BDL	Sediment	01/19/16
JF-PMU-5-0-2cm-1601119	AUK1C	Sediment	01/19/16
JF-PMU-5-0-10cm-1601119	AUK1D	Sediment	01/19/16
JF-PMN-6-0-2cm-160119	AUK1E	Sediment	01/19/16
JF-PMN-6-0-10cm-160119	AUK1F	Sediment	01/19/16
JF-PMN-5-0-2cm-160119	AUK1G	Sediment	01/19/16
JF-PMN-5-0-10cm-160119	AUK1H	Sediment	01/19/16
JF-PMN-105-0-2cm-160119	AUK1I	Sediment	01/19/16
JF-PMU-4-0-2cm-160119	AUK1J	Sediment	01/19/16
JF-PMU-4-0-2cm-160119DL	AUK1JDL	Sediment	01/19/16
JF-PMU-4-0-10cm-160119	AUK1K	Sediment	01/19/16
JF-PMU-4-0-10cm-160119DL	AUK1KDL	Sediment	01/19/16
JF-PMU-3-0-2cm-160119	AUK1L	Sediment	01/19/16
JF-PMU-3-0-2cm-160119DL	AUK1LDL	Sediment	01/19/16
JF-PMU-3-0-10cm-160119	AUK1M	Sediment	01/19/16
JF-PMU-3-0-10cm-160119MS	AUK1MMS	Sediment	01/19/16
JF-PMU-3-0-10cm-160119MSD	AUK1MMSD	Sediment	01/19/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and modified outlines of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008) and USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (October 1999). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
JF-PMU-3-0-2cm-160119	Not specified	Decachlorobiphenyl	NR (40-126)	All TCL compounds	J (all detects) UJ (all non-detects)	A

^{*}NR = Recovery is not reported due to chromatographic interference.

Surrogate recoveries (%R) were not within QC limits for sample JF-PMU-3-0-2cm-160119DL. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Affected Compound	Flag	A or P
JF-PMU-3-0-10cm-160119MS/MSD (JF-PMU-3-0-10cm-160119)	Aroclor-1260	177 (50-150)	-	Aroclor-1248 Aroclor-1254 Aroclor-1260	J (all detects) J (all detects) J (all detects)	А
JF-PMU-3-0-10cm-160119MS/MSD (JF-PMU-3-0-10cm-160119)	Aroclor-1260	177 (50-150)	-	Aroclor-1242	NA	-

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The Aroclor-1260 result in the SRM was within the QC limits, however, the laboratory also reported Aroclor-1254 and Aroclor-1248.

IX. Field Duplicates

Samples JF-PMN-5-0-2cm-160119 and JF-PMN-105-0-2cm-160119 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concer	ntration (ug/Kg)	
Compound	JF-PMN-5-0-2cm-160119	JF-PMN-105-0-2cm-160119	RPD
Aroclor-1248	12	14	15
Aroclor-1254	25	31	21
Aroclor-1260	14	20	35

X. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
JF-PMU-6-0-10cm-160119	Aroclor-1248 Aroclor-1254	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A
JF-PMU-4-0-2cm-160119	Aroclor-1254 Aroclor-1260	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A
JF-PMU-4-0-10cm-160119	Aroclor-1248 Aroclor-1254 Aroclor-1260	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects)	А
JF-PMU-3-0-2cm-160119	Aroclor-1254	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	А

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
JF-PMU-6-0-10cm-160119	Aroclor-1248 Aroclor-1254	R R	Α
JF-PMU-6-0-10cm-160119DL	All TCL compounds except Aroclor-1248 Aroclor-1254	R	А
JF-PMU-4-0-2cm-160119	Aroclor-1254 Aroclor-1260	R R	А
JF-PMU-4-0-2cm-160119DL	All TCL compounds except Aroclor-1254 Aroclor-1260	R	А
JF-PMU-4-0-10cm-160119	Aroclor-1248 Aroclor-1254 Aroclor-1260	R R R	А

Sample	Compound	Flag	A or P
JF-PMU-4-0-10cm-160119DL	All TCL compounds except Aroclor-1248 Aroclor-1254 Aroclor-1260	R	А
JF-PMU-3-0-2cm-160119	Aroclor-1254	R	Α
JF-PMU-3-0-2cm-160119DL	All TCL compounds except Aroclor-1254	R	Α

Due to surrogate %R and MS/MSD %R, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Data Qualification Summary - SDG AUK1

Sample	Compound	Flag	A or P	Reason
JF-PMU-3-0-2cm-160119	All TCL compounds except Aroclor-1254	UJ (all non-detects)	Α	Surrogates (%R)
JF-PMU-3-0-10cm-160119	Aroclor-1248 Aroclor-1254 Aroclor-1260	J (all detects) J (all detects) J (all detects)	А	Matrix spike/Matrix spike duplicate (%R)
JF-PMU-6-0-10cm-160119	Aroclor-1248 Aroclor-1254	R R	Α	Overall assessment of data
JF-PMU-6-0-10cm-160119DL	All TCL compounds except Aroclor-1248 Aroclor-1254	R	Α	Overall assessment of data
JF-PMU-4-0-2cm-160119	Aroclor-1254 Aroclor-1260	R R	Α	Overall assessment of data
JF-PMU-4-0-2cm-160119DL	All TCL compounds except Aroclor-1254 Aroclor-1260	R	Α	Overall assessment of data
JF-PMU-4-0-10cm-160119	Aroclor-1248 Aroclor-1254 Aroclor-1260	R R R	Α	Overall assessment of data
JF-PMU-4-0-10cm-160119DL	All TCL compounds except Aroclor-1248 Aroclor-1254 Aroclor-1260	R	Α	Overall assessment of data
JF-PMU-3-0-2cm-160119	Aroclor-1254	R	Α	Overall assessment of data
JF-PMU-3-0-2cm-160119DL	All TCL compounds except Aroclor-1254	R	Α	Overall assessment of data

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG AUK1

No Sample Data Qualified in this SDG

LDC #: 35878A3b	VALIDATION COMPLETENESS WORKSHEET	Date: 2/19/1
SDG #:AUK1	_ Stage 2B	Page: <u>/</u> of <u>2</u>
Laboratory: <u>Analytical Resc</u>	ources, Inc.	Reviewer:
METHOD: OO Dalaatilaatia at	ad Dinhamba (FDA OMO 40 M. II. Loopo A)	2nd Reviewer: Of

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
J.	Sample receipt/Technical holding times	AIA	
11.	Initial calibration/ICV	AIA	% PSD/101 = 20
111.	Continuing calibration	<u>A</u>	% PSD/16V ≤ 20 COV = 20
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Surrogate spikes //>	SW/A	}
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples, SRM	A/sw	LC>, SRM
IX.	Field duplicates	SIN	D= 8,10
X.	Compound quantitation/RL/LOQ/LODs	5W	
XI.	Target compound identification	N	
IIX	Overall assessment of data	5W	

Note:	A = Acceptable	ND = No compounds detected	D = Duplicate	SB=Source blank
	N = Not provided/applicable	R = Rinsate	TB = Trip blank	OTHER:
	SW = See worksheet	FB = Field blank	FB = Equipment blank	

	Client ID	Lab ID	Matrix	Date
1	JF-PMU-6-0-2cm-160119	AUK1A	Sediment	01/19/16
2	JF-PMU-6-0-10cm-160119	AUK1B	Sediment	01/19/16
3	JF-PMU-6-0-10cm-160119DL	AUK1BDL	Sediment	01/19/16
4	JF-PMU-5-0-2cm-1601119	AUK1C	Sediment	01/19/16
5	JF-PMU-5-0-10cm-1601119	AUK1D	Sediment	01/19/16
6	JF-PMN-6-0-2cm-160119	AUK1E	Sediment	01/19/16
7	JF-PMN-6-0-10cm-160119	AUK1F	Sediment	01/19/16
8	JF-PMN-5-0-2cm-160119	AUK1G	Sediment	01/19/16
9	JF-PMN-5-0-10cm-160119	AUK1H	Sediment	01/19/16
10	JF-PMN-105-0-2cm-160119	AUK1I	Sediment	01/19/16
11	JF-PMU-4-0-2cm-160119	AUK1J	Sediment	01/19/16
12	JF-PMU-4-0-2cm-160119DL	AUK1JDL	Sediment	01/19/16
13	JF-PMU-4-0-10cm-160119	AUK1K	Sediment	01/19/16
14	JF-PMU-4-0-10cm-160119DL	AUK1K LD	Sediment	01/19/16
15	JF-PMU-3-0-2cm-160119	AUK1L	Sediment	01/19/16
16	JF-PMU-3-0-2cm-160119DL	AUK1LDL	Sediment	01/19/16
17	JF-PMU-3-0-10cm-160119	AUK1M	Sediment	01/19/16

DG abo	#:_ 35878A3b	Date: 2/1 Page: 2-of Reviewer: 3 2nd Reviewer: 7		
	Client ID	Lab ID	Matrix	Date
18	JF-PMU-3-0-10cm-160119MS	AUK1MMS	Sediment	01/19/16
9_	JF-PMU-3-0-10cm-160119MSD	AUK1MMSD	Sediment	01/19/16
0				
1				
2				
3				
ote	S:			
	MB - 012116			
\perp				

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y, Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA, Aroclor-1254	II. Arochlor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:	·	 	 	

C:\Users\ftanguilig\Documents\WORKSHEETS\GC\L3\comp list pcb pest.wpd

LDC #:_	35878	A	Зb
---------	-------	---	----

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

Page:	<u>/</u> of
Reviewer:_	FT
2nd Reviewer:	01

#	Sample ID	Detec Colu		Surrogate Compound		%R (Limits	s)			Qı	ualifications
	15	NS		e e		NR (40-1	26)	7/47/	A	CDet M)
						(<u>'</u>)			<u> </u>
						()			
	16	NS		surregal	لما	autiside limit)	no 9	ual	2300 X
				0)	()		
						()			
_						()			
		 				()			
					$-\!$	()			
						(
						(<u> </u>			
)			
				-)			
						()			···
)			
						()			
					+			<u> </u>	<u> </u>		
	NR = Recover	<u>-8 i</u>	is not	reported	- 0	me To chromat	rara	phic inte	eference	<u> </u>	
<u> </u>						(<u> </u>	 		
						· · · · · · · · · · · · · · · · · · ·	_)	!		
	Surrogate Compound		Surrog	ate Compound		Surrogate Compound	<u> </u>	Surrogate Co	ompound	<u> </u>	
A	Chlorobenzene (CBZ)	G	c	ctacosane	М	Benzo(e)Pyrene	s	1-Chloro-3-Nit	robenzene	Y	Tetrachloro-m- xylene
В	4-Bromofluorobenzene (BFE		1	ho-Terphenyl	N_	Terphenyl-D14		3,4-Dinitrol		z	2-Bromonaphthalene
rc,	a,a,a-Trifluorotoluene	1	_	benzene (FBZ)	0	Decachlorobiphenyl (DCB)	<u> </u>	Tripent		AA	Chloro-octadecane
D.	Bromochlorobenene	J K		Triacontane	P Q	1-methylnaphthalene Dichlorophenyl Acetic Acid (DCAA)	w w	Tri-n-pro Tributyi Pho		BB CC	2,4-Dichlorophenylacetic acid 2,5-Dibromotoluene
=	1,4-Dichlorobutane 1,4-Difluorobenzene (DFB)	\neg		exacosane omobenzene	R	4-Nitrophenol	\ \ x	Triphenyl Ph		00	Z,0-Dibromotolidene

LDC #:_	35878 A3b
	/

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Page:	/of/
Reviewer:	FT
2nd Reviewer:	0

GC METHOD: _ _ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?

Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

u	N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?						
#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	18+19	BB	177 (50-150)	. ()	()	17	JAUT /A Detin
			()	(()		qual Y. Z. AM, BB
			()	_ ()	()		Z, AA, BB are
			. ()	()	()	<u> </u>	Y = ND
			()	. ()	()		
_	· · · · · · · · · · · · · · · · · · ·		()	()	()		
_			()		()		
_			()	()	()		
)	()	()	:	
			()	_ ()	()		
			()	()	()		
	×		()	()	()		
			()	()	()		
			()	()	()		
			()	()	()		
			()	()	()	,	
\neg			()	()	()		
			()	()	()		
	1.72		()	. ()	()		
	· '		()	()	()		
			()	()	()		
\neg			()	()	()	*	
			()	()	()		
			()	()	()	<u> </u>	

MSD_r1.wpd

LDC #:	35 B78	ABB
--------	--------	-----

VALIDATION FINDINGS WORKSHEET <u>SRM</u>

Page:_	<u>/</u> of
Reviewer:_	<u>FT</u>
2nd Reviewer:_	01

METHOD: __ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Not applicable questions are identified as "N/A".

Was SRM analyzed for each matrix in this SDG?

Was the SRM recoveries within the limits?

#	SRM	Compound			Associated Samples	Qualifications
	SRM PSR		The Aroclor-1260 result in the standard reference material (SRM) was within the QC limits. However, the laboratory also reported Aroclor-1254 and aroclor 1248.			Text

SRM PCB Text.wpd

LDC#:	35878	A3b
-------	-------	-----

VALIDATION FINDINGS WORKSHEET Compound Quantitation and Reported CRQLs

Page:	<u>/_of_7</u>
Reviewer:	FT
2nd Reviewer:	0

METHOD: VGC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level W/D Only

Y N W/A

Y N W/A

Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Findings	Associated Samples	Qualifications
	2, AA, DK F7	x'd cal Range	_2	Jdut/A
		J	<u> </u>	
	AA BB		1)	
	Z, AA, BB		13	
	·			
	AA	V	15	
<u> </u>	The same and the s			
	·			
 				

Comments:	See sample calculation verification worksheet for recalculations		

COMQUA_r1.wpd

LDC# 35878 A3b

VALIDATION FINDINGS WORKSHEET <u>Overall Assessment of Data</u>

Page:	<u>/_of/</u>
Reviewer:	FT
2nd Reviewer:	$\subseteq C_1$
	7

METHOD: _GC _HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

YN N/A Was the overall quality and usability of the data acceptable?

#	Associated samples	Compounds	Findings	Qualifications
	2	2 , AA	x'd cal Range	R/A
	3	all except Z, A.A	dituted	
	11	AA, BB	xld cal Range	
	12	all except AA, BB	diluted	
	13	Z, AA, BB	x'd cal Range	
	14	all except Z, AA, BB	diluted	
	15	AA	x'd cal Range	
	11	all except AA	dituted	

Comments:	 		
		 -	

OVR_r1.wpd

LDC #:	3587	8A3h

VALIDATION FINDINGS WORKSHEET

Page:_	<u></u>
eviewer:_	FT
roviousom	01

Field Duplicates 2nd reviewer: O METHOD: // GC __ HPLC /Y] N N/A Were field dup Were field duplicate pairs identified in this SDG? √ N N/A Were target compounds detected in the field duplicate pairs? Concentration (%RPD Qualification Limit (≤____%) Compound (Parent only) 15 25 3/ 2/ AA 35 20 BB Concentration (%RPD Qualification Compound Limit (≤____%) (Parent only) Concentration (%RPD Qualification Limit (≤____%)) Compound (Parent only)

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 2, 2016

Parameters:

Metals

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUK1

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-PMU-6-0-2cm-160119	AUK1A	Sediment	01/19/16
JF-PMU-6-0-10cm-160119	AUK1B	Sediment	01/19/16
JF-PMU-5-0-2cm-1601119	AUK1C	Sediment	01/19/16
JF-PMU-5-0-10cm-1601119	AUK1D	Sediment	01/19/16
JF-PMN-6-0-2cm-160119	AUK1E	Sediment	01/19/16
JF-PMN-6-0-10cm-160119	AUK1F	Sediment	01/19/16
JF-PMN-5-0-2cm-160119	AUK1G	Sediment	01/19/16
JF-PMN-5-0-10cm-160119	AUK1H	Sediment	01/19/16
JF-PMN-105-0-2cm-160119	AUK1I	Sediment	01/19/16
JF-PMU-4-0-2cm-160119	AUK1J	Sediment	01/19/16
JF-PMU-4-0-10cm-160119	AUK1K	Sediment	01/19/16
JF-PMU-3-0-2cm-160119	AUK1L	Sediment	01/19/16
JF-PMU-3-0-10cm-160119	AUK1M	Sediment	01/19/16
JF-PMU-6-0-2cm-160119MS	AUK1AMS	Sediment	01/19/16
JF-PMU-6-0-2cm-160119DUP	AUK1ADUP	Sediment	01/19/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Cadmium, Chromium, Copper, Lead, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A Mercury by EPA SW 846 Method 7471A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Lead Mercury	0.0050 mg/Kg 0.00083 mg/Kg	All samples in SDG AUK1

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JF-PMU-6-0-2cm-160119MS (All samples in SDG AUK1)	Silver	28.6 (75-125)	J (all detects)	А

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
JF-PMU-6-0-2cm-160119DUP	Chromium	41.8 (≤35)	J (all detects)	А
(All samples in SDG AUK1)	Lead	109 (≤35)	J (all detects)	

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples JF-PMN-5-0-2cm-160119 and JF-PMN-105-0-2cm-160119 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentrat		
Analyte	JF-PMN-5-0-2cm-160119	JF-PMN-105-0-2cm-160119	RPD (Limits)
Arsenic	5.7	5.5	4 (≤50)
Cadmium	0.12	0.11	9 (≤50)
Chromium	16.9	16.4	3 (≤50)
Copper	23.7	23.2	2 (≤50)
Lead	8.72	8.02	8 (≤50)
Mercury	0.07	0.17	83 (≤50)

	Concentration (mg/Kg)		
Analyte	JF-PMN-5-0-2cm-160119	-2cm-160119 JF-PMN-105-0-2cm-160119 RP	
Silver	0.104	0.096	8 (≤50)
Zinc	61	58	5 (≤50)

XII. Internal Standards (ICP-MS)

Internal standards data were not reviewed for Stage 2B validation.

XIII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS %R and DUP RPD, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Metals - Data Qualification Summary - SDG AUK1

Sample	Analyte	Flag	A or P	Reason
JF-PMU-6-0-2cm-160119 JF-PMU-6-0-10cm-160119 JF-PMU-5-0-2cm-1601119 JF-PMU-5-0-10cm-1601119 JF-PMN-6-0-2cm-160119 JF-PMN-6-0-10cm-160119 JF-PMN-5-0-2cm-160119 JF-PMN-105-0-2cm-160119 JF-PMU-4-0-2cm-160119 JF-PMU-4-0-10cm-160119 JF-PMU-4-0-10cm-160119 JF-PMU-3-0-10cm-160119 JF-PMU-3-0-10cm-160119	Silver	J (all detects)	Α	Matrix spike (%R)
JF-PMU-6-0-2cm-160119 JF-PMU-6-0-10cm-160119 JF-PMU-5-0-2cm-1601119 JF-PMU-5-0-10cm-1601119 JF-PMN-6-0-2cm-160119 JF-PMN-6-0-10cm-160119 JF-PMN-5-0-2cm-160119 JF-PMN-5-0-2cm-160119 JF-PMU-4-0-2cm-160119 JF-PMU-4-0-10cm-160119 JF-PMU-4-0-10cm-160119 JF-PMU-3-0-2cm-160119	Chromium Lead	J (all detects) J (all detects)	Α	Duplicate sample analysis (RPD)

Jorgensen Forge Early Action Area Metals - Laboratory Blank Data Qualification Summary - SDG AUK1

No Sample Data Qualified in this SDG

_DC #:	35878A4a	VALIDATION COMPLETENESS WORKSHEET
		01 00

SDG #: AUK1 Stage 2B Laboratory: Analytical Resources, Inc.

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020A/7471A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Sample receipt/Technical holding times	Α	
II.	ICP/MS Tune	Α	
III.	Instrument Calibration	Α	
IV.	ICP Interference Check Sample (ICS) Analysis	Α	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	7	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS
VIII.	Duplicate sample analysis	SW	DUP
IX.	Serial Dilution	2	not performed
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	D=7+9
XII.	Internal Standard (ICP-MS)	N	not reviewed for Stage 2B
XIII.	Sample Result Verification	N	<i>U</i>
LxIV	Overall Assessment of Data	Α	

Note: A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

					
	Client ID	Lab ID	Matrix	Date	
1	JF-PMU-6-0-2cm-160119	AUK1A	Sediment	01/19/16	
2	JF-PMU-6-0-10cm-160119	AUK1B	Sediment	01/19/16	
3	JF-PMU-5-0-2cm-1601119	AUK1C	Sediment	01/19/16	
4	JF-PMU-5-0-10cm-1601119	AUK1D	Sediment	01/19/16	
5	JF-PMN-6-0-2cm-160119	AUK1E	Sediment	01/19/16	
6	JF-PMN-6-0-10cm-160119	AUK1F	Sediment	01/19/16	
7	JF-PMN-5-0-2cm-160119	AUK1G	Sediment	01/19/16	
8	JF-PMN-5-0-10cm-160119	AUK1H	Sediment	01/19/16	
9	JF-PMN-105-0-2cm-160119	AUK1I	Sediment	01/19/16	
10	JF-PMU-4-0-2cm-160119	AUK1J	Sediment	01/19/16	
11	JF-PMU-4-0-10cm-160119	AUK1K	Sediment	01/19/16	
12	JF-PMU-3-0-2cm-160119	AUK1L	Sediment	01/19/16	
13	JF-PMU-3-0-10cm-160119	AUK1M	Sediment	01/19/16	
14	JF-PMU-6-0-2cm-160119MS	AUK1AMS	Sediment	01/19/16	
15	JF-PMU-6-0-2cm-160119DUP	AUK1ADUP	Sediment	01/19/16	

SDG Labo	LDC #: 35878A4a VALIDATION COMPLETENESS WORKSHEET SDG #: AUK1 Stage 2B Laboratory: Analytical Resources, Inc. METHOD: Metals (EPA SW 846 Method 6020A/7471A)			Date: 3-1-16 Page: 2 of 2 eviewer: MG eviewer: C
	Client ID	Lab ID	Matrix	Date
16 17				
17				
18				
19				
20	PBS			
Note	S:			

LDC #: 35878A4a

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	_of
Reviewer:	MG_
2nd reviewer:	0

All circled elements are applicable to each sample.

	I	
Sample ID	Matrix	Target Analyte List (TAL)
1->13	sed	AI, Sb, As) Ba, Be, Cd, Ca, Cr) Co, Cu) Fe, Pb) Mg, Mn, Hg) Ni, K, Se, Ag) Na, TI, V, Zn) Mo, B, Si, CN',
QC 14,15	\downarrow	Al, Sb, As) Ba, Be, Cd, Ca, Co, Co, Co, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V(Zn) Mo, B, Si, CN',
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
ICP-MS		Al, Sb(As) Ba, Be, Cd) Ca(Cr) Co(Cu) Fe, (Pb) Mg, Mn, Hg, Ni, K, Se, (Ag) Na, Tl, V(Zr), Mo, B, Si, CN,
GEAA	l	Al Sh As Ba Be Cd Ca Cr Co Cu Fe Ph Mg Mn Hg Ni K Se Ag Na Tl V Zn Mo B Si CN

Comments: Mercury by CVAA if performed	

LDC #: <u>35878A4a</u> SDG #: <u>See Cover</u>

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: MG

2nd Reviewer: C

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: mg/kg

Soil preparation factor applied: 25x

Associated Samples: all (>5x)

		1100						er en salt	海外。		
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)		No Qual's.						
Pb	0.0050			0.0250							
Hg	0.00083			0.00415							

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 35878A4a

VALIDATION FINDINGS WORKSHEET <u>Matrix Spike Analysis</u>

Page:_	<u>l_of_l_</u>
Reviewer:	MG
nd Reviewer:	01

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified a	d as "N/A'	are identified	questions are i	Not applicable of	I questions answered "N"	below for all	see qualifications	Please
---	------------	----------------	-----------------	-------------------	--------------------------	---------------	--------------------	--------

Was a matrix spike analyzed for each matrix in this SDG?

Y N/A

Were matrix spike percent recoveries (%R) within the cont

Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor

of 4 or more, no action was taken.

Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
П		14	sed.	Aq	28.6	all	J/UJ/A * (all dets)
				σ			
Н							
Н							
Н							
L							
╟							
-							
\vdash							
$\ -$							

Comments:	*	post digestion	spike	in	limit	(105.8%)	50	no	R"	qual.	for	N.D.S.	
		'		•						V			

LDC#: 35878 A 4a

VALIDATION FINDINGS WORKSHEET <u>Duplicate Analysis</u>

	Page:_	1 of 1	
	Reviewer:	MG	
2nd	Reviewer:	<u></u>	

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

and the second of the second o

Y N N/A

Was a duplicate sample analyzed for each matrix in this SDG?

Y N N/A

Were all duplicate sample relative percent differences (RPD) \leq 20% for water samples and \leq 35% for soil samples? If no, see qualifications below. A control limit of \pm R.L. (\pm 2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was

<5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. RPD (Limits) Difference (Limits) Duplicate ID Matrix Analyte Associated Samples Qualifications Date Sed. 41.8 (420) 15 JUJA (all dets) Cr all Pb 109

Comments:	 		

DUP.4SW

LDC#: 35878A4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: of Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA Method 6020A/7471A)

	Concentra	tion (mg/Kg)		
Analyte	7	9	RPD (≤50)	
Arsenic	5.7	5.5	4	
Cadmium	0.12	0.11	9	
Chromium	16.9	16.4	3	
Соррег	23.7	23.2	2	
Lead	8.72	8.02	8	
Mercury	0.07	0.17	83	
Silver	0.104	0.096	8	
Zinc	61	58	5	

V:\FIELD DUPLICATES\FD_inorganic\35878A4a.WPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 21, 2016

Parameters:

Wet Chemistry

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc./

Materials Testing & Consulting, Inc.

Sample Delivery Group (SDG): AUK1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-PMU-6-0-2cm-160119	AUK1A	Sediment	01/19/16
JF-PMU-6-0-10cm-160119	AUK1B .	Sediment	01/19/16
JF-PMU-5-0-2cm-1601119	AUK1C	Sediment	01/19/16
JF-PMU-5-0-10cm-1601119	AUK1D	Sediment	01/19/16
JF-PMN-6-0-2cm-160119	AUK1E	Sediment	01/19/16
JF-PMN-6-0-10cm-160119	AUK1F	Sediment	01/19/16
JF-PMN-5-0-2cm-160119	AUK1G	Sediment	01/19/16
JF-PMN-5-0-10cm-160119	AUK1H	Sediment	01/19/16
JF-PMN-105-0-2cm-160119	AUK1I	Sediment	01/19/16
JF-PMU-4-0-2cm-160119	AUK1J	Sediment	01/19/16
JF-PMU-4-0-10cm-160119	AUK1K	Sediment	01/19/16
JF-PMU-3-0-2cm-160119	AUK1L	Sediment	01/19/16
JF-PMU-3-0-10cm-160119	AUK1M	Sediment	01/19/16
JF-PMU-6-0-2cm-160119MS	AUK1AMS	Sediment	01/19/16
JF-PMU-6-0-2cm-160119DUP	AUK1ADUP	Sediment	01/19/16
JF-PMU-6-0-10cm-160119DUP	AUK1BDUP	Sediment	01/19/16
JF-PMU-6-0-10cm-160119TRP	AUK1BTRP	Sediment	01/19/16
JF-PMU-6-0-2cm-160119TRP	AUK1ATRP	Sediment	01/19/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Grain Size by Puget Sound Estuary Protocols (PSEP) Method Specific Gravity by American Society for Testing and Materials (ASTM) D854 Total Organic Carbon by Plumb Method Total Solids by Standard Method 2540G Moisture Content by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JF-PMU-6-0-2cm-160119MS (All samples in SDG AUK1)	Total organic carbon	38.8 (75-125)	J (all detects)	А

VII. Triplicates Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

Samples JF-PMN-5-0-2cm-160119 and JF-PMN-105-0-2cm-160119 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Conce		
Analyte	JF-PMN-5-0-2cm-160119	JF-PMN-105-0-2cm-160119	RPD (Limits)
Specific gravity	2.73	2.67	2 (≤50)
Total organic carbon	1.16 %	1.21 %	4 (≤50)
Total solids	61.49 %	61.49 %	0 (≤50)

	Percent Finer Than		
Sieve Size (microns)	JF-PMN-5-0-2cm-160119	JF-PMN-105-0-2cm-160119	RPD (Limits)
#10 (2000)	99.8	99.8	0 (≤50)
#18 (1000)	99.3	99.4	0 (≤50)
#35 (500)	98.1	98.2	0 (≤50)
#60 (250)	94.3	94.3	0 (≤50)
#120 (125)	62.8	62.8	0 (≤50)
#230 (63)	40.0	39.9	0 (≤50)
31.0	27.0	26.5	2 (≤50)
15.6	18.2	18.6	2 (≤50)
7.8	12.5	12.2	2 (≤50)
3.9	8.5	8.2	4 (≤50)
2.0	5.8	5.8	0 (≤50)
1.0	3.9	3.7	5 (≤50)

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS %R, data were qualified as estimated in thirteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Wet Chemistry - Data Qualification Summary - SDG AUK1

Sample	Analyte	Flag	A or P	Reason
JF-PMU-6-0-2cm-160119 JF-PMU-6-0-10cm-160119 JF-PMU-5-0-2cm-1601119 JF-PMU-5-0-10cm-1601119 JF-PMN-6-0-2cm-160119 JF-PMN-6-0-10cm-160119 JF-PMN-5-0-2cm-160119 JF-PMN-5-0-10cm-160119 JF-PMU-4-0-2cm-160119 JF-PMU-4-0-10cm-160119 JF-PMU-4-0-10cm-160119 JF-PMU-3-0-2cm-160119	Total organic carbon	J (all detects)	Α	Matrix spike (%R)

Jorgensen Forge Early Action Area
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG AUK1

No Sample Data Qualified in this SDG

VALIDATION COMPLETENESS WORKSHEET LDC #: 35878A6 SDG #: AUK1 Level III Page: 1 of 2 Laboratory: Analytical Resources, Inc./Materials Testing & Consulting, Inc. Reviewer: MG 2nd Reviewer:

METHOD: (Analyte) Grain Size (PSEP Method), Specific Gravity (ASTM D854), TOC (Plumb), Total Solids (SM 2540G)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Sample receipt/Technical holding times	A	
	Initial calibration	A	
_ 111.	Calibration verification	Α	
IV	Laboratory Blanks	A	
	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW.	MS
VII.	Duplicate sample analysis	SWA	TREP
VIII.	Laboratory control samples	A	LCS/SRM
IX.	Field duplicates	SW	D= 7+9
X.	Sample result verification	N	
ΧI	Overall assessment of data	A	

Note:

A = Acceptable

SW = See worksheet

N = Not provided/applicable

ND = No compounds detected

R = Rinsate FB = Field blank

D = Duplicate

TB = Trip blank
EB = Equipment blank

SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-PMU-6-0-2cm-160119	AUK1A	Sediment	01/19/16
2	JF-PMU-6-0-10cm-160119	AUK1B	Sediment	01/19/16
3	JF-PMU-5-0-2cm-1601119	AUK1C	Sediment	01/19/16
4	JF-PMU-5-0-10cm-1601119	AUK1D	Sediment	01/19/16
5	JF-PMN-6-0-2cm-160119	AUK1E	Sediment	01/19/16
6	JF-PMN-6-0-10cm-160119	AUK1F	Sediment	01/19/16
7	JF-PMN-5-0-2cm-160119	AUK1G	Sediment	01/19/16
8	JF-PMN-5-0-10cm-160119	AUK1H	Sediment	01/19/16
9	JF-PMN-105-0-2cm-160119	AUK1I	Sediment	01/19/16
10	JF-PMU-4-0-2cm-160119	AUK1J	Sediment	01/19/16
11	JF-PMU-4-0-10cm-160119	AUK1K	Sediment	01/19/16
12	JF-PMU-3-0-2cm-160119	AUK1L	Sediment	01/19/16
13	JF-PMU-3-0-10cm-160119	AUK1M	Sediment	01/19/16
14	JF-PMU-6-0-2cm-160119MS	AUK1AMS	Sediment	01/19/16
15	JF-PMU-6-0-2cm-160119DUP	AUK1ADUP	Sediment	01/19/16
16	JF-PMU-6-0-10cm-160119DUP	AUK1BDUP	Sediment	01/19/16
17	JF-PMU-6-0-10cm-160119TRP	AUK1BTRP	Sediment	01/19/16

LDC #: 35878A6 VALIDATION COMPLETENESS WORKSHEET Date: 3-				
SDC	G #:AUK1		Page: 2 of 2	
Lab	oratory: <u>Analytical Resources, Inc./Materials Testing</u>	& Consulting, Inc.	I	Reviewer: MG
			2nd I	Reviewer:
2457	FHOD: (Analyte) Grain Size (PSEP Method), Specif	io Gravity (ASTM D854). TOC (Plus	mb) Total Soli	de (SM 2540C)
IVIL	THOD. (Allalyte) Glain Size (FSEF Method), Specif	IC Gravity (AGTIVI D004), TOC (Flui	TID), TOLAR COII	GS (GIVI 2040G)
	Client ID	Lab ID	Matrix	Date
10	JF-PMU-6-0-2cm-160119TRP	AUKIATRP	Sed.	1/19/16
18	01-1110 0 0 0000 10011 [1 12]	AURIATE	3001	1711716
19				
20				
21	PBS			
Note	9S:			

LDC#35878A6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: of Page: Of Page: MG 2nd reviewer: Of Page: No. 1

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-)13	sed	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN" NH3 TKN (TOO CR8+ CIO4 (T.S) (Grain) (S.G.)
OC 14	1	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN (TO) CR6+ CIO4
15,18		pH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOO CR6+ CIO, T.S.
16,17	4	ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4 (Grain) Size (S.G.)
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR8+ CIO4
		PH TDS CLE NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CI F NO3 NO, SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO, SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN'NH3 TKN TOC CR5+ ClO4
		ph tds cif No3 No2 So4 Po4 Alk CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR5+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO, SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN. NH3 TKN TOC CR6+ CIO4
		pH TDS_CLF_NO ₂ NO ₂ SO, PO, ALK_CN ⁻ NH ₂ TKN_TOC_CR ⁶⁺ CIO,

Comments:				

I DC #	35 E	378A6
--------	------	-------

VALIDATION FINDINGS WORKSHEET Matrix Spike Analysis

Page:_	of
Reviewer:_	MG
2nd Reviewer:	5

METHOD: Inorganics, Method	see cover
me ine en mongamos, montos	

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a matrix spike analyzed for each matrix in this SDG?

Was a matrix spike analyzed for each matrix in this SDG? Y(N) N/A

Were matrix spike percent recoveries (%R) within the control limits o 75-125 85-115% for Method 300.0)? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

LEVEL IV ONLY:

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. Y N N/A

#	Date	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
		14	sed.	TOC	38.8	all	J/UJ/A (all dets)
ļ							
 							
-						<u>-</u>	
							
 	<u> </u>						
-		<u> </u>					
-							
<u> </u>							
-							
ļ	ļ		ļ.,	 			
-	<u> </u>			 			
				ļ			

Comments:		

LDC#: 35878A6

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: 1 of 7
Reviewer: MG
2nd Reviewer: _____

Inorganics, Method See Cover

	Concentr	ation (%)		
Analyte	7	9	RPD (≤50)	
Specific Gaavity (no units)	2.73	2.67	2	
Total Organic Carbon	1.16	1.21	4	
Total Solids	61.49	61.49	0	

V:\FIELD DUPLICATES\FD_inorganic\35878A6a.WPD

LDC#_35878A6 VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: $\frac{2}{2}$ of $\frac{2}{2}$ Reviewer: $\frac{MG}{2}$ 2nd Reviewer:

Inorganics: Method See Cover

	Percent Finer Than	the Indicated Size (%)		
Sieve Size (microns)	7	9	RPD (≤50)	
3/8"	100.0	100.0	0	
#4 (4750)	100.0	100.0	0	
#10 (2000)	99.8	99.8	0	
#18 (1000)	99.3	99.4	0	
#35 (500)	98.1	98.2	0	
#60 (250)	94.3	94.3	0	
#120 (125)	62.8	62.8	0	
#230 (63)	40.0	39.9	0	
31.0	27.0	26.5	2	
15.6	18.2	18.6	2	
7.8	12.5	12.2	2	
3.9	8.5	8.2	4	
2.0	5,8	5.8	0	
1.0	3.9	3.7	5	

V:\FIELD DUPLICATES\FD_inorganic\35878A6b.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 11, 2016

Parameters:

Polychlorinated Biphenyls

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUL1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-LTR-8-0-2cm-160120	AUL1A	Sediment	01/20/16
JF-LTR-8-0-10cm-160120	AUL1B	Sediment	01/20/16
JF-LTR-1-0-2cm-160120	AUL1C	Sediment	01/20/16
JF-LTR-1-0-10cm-160120	AUL1D	Sediment	01/20/16
JF-LTR-13-0-2cm-160120	AUL1E	Sediment	01/20/16
JF-LTR-13-0-10cm-160120	AUL1F	Sediment	01/20/16
JF-LTR-7-0-2cm-160120	AUL1G	Sediment	01/20/16
JF-LTR-7-0-10cm-160120	AUL1H	Sediment	01/20/16
JF-LTR-2-0-2cm-160120	AUL1I	Sediment	01/20/16
JF-LTR-2-0-10cm-160120	AUL1J	Sediment	01/20/16
JF-LTR-3-0-2cm-160120	AUL1K	Sediment	01/20/16
JF-LTR-3-0-10cm-160120	AUL1L	Sediment	01/20/16
JF-LTR-103-0-10cm-160120	AUL1M	Sediment	01/20/16
JF-LTR-9-0-2-cm-160120	AUL1N	Sediment	01/20/16
JF-LTR-9-0-10cm-160120	AUL10	Sediment	01/20/16
JF-LTR-7-0-10cm-160120MS	AUL1HMS	Sediment	01/20/16
JF-LTR-7-0-10cm-160120MSD	AUL1HMSD	Sediment	01/20/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and modified outlines of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008) and USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (October 1999). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The Aroclor-1260 result in the SRM was within the QC limits, however, the laboratory also reported Aroclor-1254 and Aroclor-1248.

IX. Field Duplicates

Samples JF-LTR-3-0-10cm-160120 and JF-LTR-103-0-10cm-160120 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concent		
Compound	JF-LTR-3-0-10cm-160120	JF-LTR-103-0-10cm-160120	RPD
Aroclor-1248	16	17	6
Aroclor-1254	32	34	6
Aroclor-1260	15	14	7

X. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Data Qualification Summary - SDG AUL1

No Sample Data Qualified in this SDG

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG AUL1

No Sample Data Qualified in this SDG

LDC #: 35878B3b	VALIDATION COMPLETENESS WORKSHEET
SDG #: AUL1	Stage 2B
Laboratory: Analytical Resor	urces. Inc.

Date:_	2,	/19/16	
Page:	/of_	2	
Reviewer:		P	
2nd Reviewer:	a'		

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	A _A	
11.	Initial calibration/ICV	A,A	% PSD /1CV = 20
111.	Continuing calibration	A	cd = 20
IV.	Laboratory Blanks	D,	
V.	Field blanks	N N	
VI.	Surrogate spikes / 15	Δ	
VII.	Matrix spike/Matrix spike duplicates	4	
VIII.	Laboratory control samples , 5 RM	∆/su	LC7, SRM
IX.	Field duplicates	SN	D=17, 13
X	Compound quantitation/RL/LOQ/LODs	N	1 '
XI.	Target compound identification	N	
ווא	Overall assessment of data	A	

Note: A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

Client ID Lab ID Matrix Date JF-LTR-8-0-2cm-160120 AUL1A Sediment 01/20/16 JF-LTR-8-0-10cm-160120 AUL1B Sediment 01/20/16 01/20/16 3 JF-LTR-1-0-2cm-160120 AUL1C Sediment JF-LTR-1-0-10cm-160120 AUL1D Sediment 01/20/16 5 JF-LTR-13-0-2cm-160120 AUL1E Sediment 01/20/16 6 JF-LTR-13-0-10cm-160120 AUL1F Sediment 01/20/16 JF-LTR-7-0-2cm-160120 AUL1G Sediment 01/20/16 JF-LTR-7-0-10cm-160120 AUL1H Sediment 01/20/16 9 AUL1I Sediment 01/20/16 JF-LTR-2-0-2cm-160120 10 JF-LTR-2-0-10cm-160120 AUL1J Sediment 01/20/16 JF-LTR-3-0-2cm-160120 AUL1K Sediment 01/20/16 D 12 JF-LTR-3-0-10cm-160120 AUL1L Sediment 01/20/16 0 13 JF-LTR-103-0-10cm-160120 AUL1M Sediment 01/20/16 14 JF-LTR-9-0-2-cm-160120 AUL1N Sediment 01/20/16 15 JF-LTR-9-0-10cm-160120 AUL10 Sediment 01/20/16 01/20/16 16 JF-LTR-7-0-10cm-160120MS AUL1HMS Sediment 01/20/16 AUL1HMSD Sediment JF-LTR-7-0-10cm-160120MSD

Date: 1/19/16 Page: 2 of 2 viewer: 5
Date

LDC #:_	35878	BB	5
---------	-------	----	---

VALIDATION FINDINGS WORKSHEET <u>SRM</u>

of
FT
<u>a</u>

METHOD: 1GC_HPLC

Plèase see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

| Y N/A | Was SRM analyzed for each matrix in this SDG?
| Y N/A | Was the SRM recoveries within the limits?

	1					
#_	SRM	Compound			Associated Samples	Qualifications
	SRM PSR		The Aroclor-1260 result in the standard reference mate	erial (SRM) was within		Text
			the QC limits. However, the laboratory also reports aroclor 1248.	ed Aroclor-1254 and		
					·	
<u> </u>						
 						
 -						
 						
 						
 					<u> </u>	
	<u> </u>					
 						

SRM PCB Text.wpd

LDC #: 35878B3b METHOD: GCHPLC Y N N/A Were field duplicate pairs in Were target compounds de		FINDINGS WORK Field Duplicates irs?	SHEET	Page:/of Reviewer:FT 2nd reviewer:
Compound	Concentration	- IN 7	%RPD Limit (≤%)	Qualification (Parent only)
2	طا	17	6	
AA	32	34	6	
ВВ	15	14	7	
Compound	Concentration	()	%RPD Limit (≤%)	Qualification (Parent only)
	0		9/222	Overlife -4:
Compound	Concentration	() I	%RPD Limit (<%))	Qualification (Parent only)

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 2, 2016

Parameters:

Metals

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUL1

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-8-0-2cm-160120	AUL1A	Sediment	01/20/16
JF-LTR-8-0-10cm-160120	AUL1B	Sediment	01/20/16
JF-LTR-1-0-2cm-160120	AUL1C	Sediment	01/20/16
JF-LTR-1-0-10cm-160120	AUL1D	Sediment	01/20/16
JF-LTR-13-0-2cm-160120	AUL1E	Sediment	01/20/16
JF-LTR-13-0-10cm-160120	AUL1F	Sediment	01/20/16
JF-LTR-7-0-2cm-160120	AUL1G	Sediment	01/20/16
JF-LTR-7-0-10cm-160120	AUL1H	Sediment	01/20/16
JF-LTR-2-0-2cm-160120	AUL1I	Sediment	01/20/16
JF-LTR-2-0-10cm-160120	AUL1J	Sediment	01/20/16
JF-LTR-3-0-2cm-160120	AUL1K	Sediment	01/20/16
JF-LTR-3-0-10cm-160120	AUL1L	Sediment	01/20/16
JF-LTR-103-0-10cm-160120	AUL1M	Sediment	01/20/16
JF-LTR-9-0-2-cm-160120	AUL1N	Sediment	01/20/16
JF-LTR-9-0-10cm-160120	AUL1O	Sediment	01/20/16
JF-LTR-8-0-2cm-160120MS	AUL1AMS	Sediment	01/20/16
JF-LTR-8-0-2cm-160120DUP	AUL1ADUP	Sediment	01/20/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Cadmium, Chromium, Copper, Lead, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A Mercury by EPA SW 846 Method 7471A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Cadmium Chromium Lead Silver	0.0050 mg/Kg 0.08 mg/Kg 0.0200 mg/Kg 0.005 mg/Kg	All samples in SDG AUL1

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JF-LTR-8-0-2cm-160120MS (All samples in SDG AUL1)	Silver	23.8 (75-125)	J (all detects)	А

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples JF-LTR-3-0-10cm-160120 and JF-LTR-103-0-10cm-160120 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentra		
Analyte	JF-LTR-3-0-10cm-160120	JF-LTR-103-0-10cm-160120	RPD (Limits)
Arsenic	3.7	3.0	21 (≤50)
Cadmium	0.0600	0.0500	18 (≤50)
Chromium	19.1	13.9	32 (≤50)
Copper	20.9	23.5	12 (≤50)
Lead	5.78	4.93	16 (≤50)
Mercury	0.025	0.03	18 (≤50)
Silver	0.066	0.062	6 (≤50)
Zinc	34	32	6 (≤50)

XII. Internal Standards (ICP-MS)

Internal standards data were not reviewed for Stage 2B validation.

XIII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS %R, data were qualified as estimated in fifteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Metals - Data Qualification Summary - SDG AUL1

Sample	Analyte	Flag	A or P	Reason
JF-LTR-8-0-2cm-160120 JF-LTR-8-0-10cm-160120 JF-LTR-1-0-2cm-160120 JF-LTR-13-0-10cm-160120 JF-LTR-13-0-10cm-160120 JF-LTR-7-0-10cm-160120 JF-LTR-7-0-10cm-160120 JF-LTR-7-0-10cm-160120 JF-LTR-2-0-2cm-160120 JF-LTR-2-0-10cm-160120 JF-LTR-3-0-10cm-160120 JF-LTR-3-0-10cm-160120 JF-LTR-3-0-10cm-160120 JF-LTR-9-0-10cm-160120 JF-LTR-9-0-10cm-160120	Silver	J (all detects)	A	Matrix spike (%R)

Jorgensen Forge Early Action Area Metals - Laboratory Blank Data Qualification Summary - SDG AUL1

No Sample Data Qualified in this SDG

LDC #: 35878B4a VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Page: 1 of 2
Reviewer: MG
2nd Reviewer:

Laboratory: Analytical Resources, Inc.

SDG #: AUL1

METHOD: Metals (EPA SW 846 Method 6020A/7471A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area	_	Comments
l.	Sample receipt/Technical holding times	A	
II.	ICP/MS Tune	Α	
III.	Instrument Calibration	Α	
IV.	ICP Interference Check Sample (ICS) Analysis	Α	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	7	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS
VIII.	Duplicate sample analysis	Α	to up
IX.	Serial Dilution	7	not performed
X.	Laboratory control samples	Α	LCS
XI.	Field Duplicates	SW	D=12+13
XII.	Internal Standard (ICP-MS)	7	not reviewed for Stage 2B
XIII.	Sample Result Verification	N	<i>V</i>
XIV	Overall Assessment of Data	A	

Note: A = A

A = Acceptable

N = Not provided/applic

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-8-0-2cm-160120	AUL1A	Sediment	01/20/16
2	JF-LTR-8-0-10cm-160120	AUL1B	Sediment	01/20/16
3	JF-LTR-1-0-2cm-160120	AUL1C	Sediment	01/20/16
4	JF-LTR-1-0-10cm-160120	AUL1D	Sediment	01/20/16
5	JF-LTR-13-0-2cm-160120	AUL1E	Sediment	01/20/16
6	JF-LTR-13-0-10cm-160120	AUL1F	Sediment	01/20/16
7	JF-LTR-7-0-2cm-160120	AUL1G	Sediment	01/20/16
8	JF-LTR-7-0-10cm-160120	AUL1H	Sediment	01/20/16
9	JF-LTR-2-0-2cm-160120	AUL1I	Sediment	01/20/16
10	JF-LTR-2-0-10cm-160120	AUL1J	Sediment	01/20/16
11	JF-LTR-3-0-2cm-160120	AUL1K	Sediment	01/20/16
12	JF-LTR-3-0-10cm-160120	AUL1L	Sediment	01/20/16
13	JF-LTR-103-0-10cm-160120	AUL1M	Sediment	01/20/16
14	JF-LTR-9-0-2-cm-160120	AUL1N	Sediment	01/20/16
15	JF-LTR-9-0-10cm-160120	AUL10	Sediment	01/20/16

LDC #:	35878B4a

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

SDG #:__AUL1 Laboratory: <u>Analytical Resources, Inc.</u> Date: 3-1-16
Page: 2-of 2
Reviewer: MG
2nd Reviewer: _____

METHOD: Metals (EPA SW 846 Method 6020A/7471A)

Lab ID	Matrix	Date
AUL1AMS	Sediment	01/20/16
AUL1ADUP	Sediment	01/20/16
	AUL1AMS	AUL1AMS Sediment

Notes:				
			 	-
			 	_

LDC#: 35878B4a

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page: ___ of __ Reviewer: __ MG 2nd reviewer: __ C

All circled elements are applicable to each sample.

Sample ID		Target Analyte List (TAL)
1->15	sed.	Al, Sb,(As,)Ba, Be(Cd)(Ca,(Cr)(Co,(Cu),Fe,(Pb)Mg, Mn,(Hg)Ni, K, Se,(Ag, Na, Tl, V(Zn)Mo, B, Si, CN ⁻ ,
OC 16,17		Al, Sb,(As)Ba, Be,(Cd)Ca,(Cr)Co,(Cu)Fe,(Pb)Mg, Mn,(Hg)Ni, K, Se,(Ag)Na, Tl, V,(Zn,)Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
	l l	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
	i	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
ICP-MS		AI, Sb, As Ba, Be, Cd) Ca(Cr) Co, Cu) Fe(Pb) Mg, Mn, Hg, Ni, K, Se, Ag Na, Ti, V(Zn) Mo, B, Si, CN;
GEAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN

Comments: Mercury by CVAA if performed

LDC #: 35878B4a SDG #: See Cover

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: mg/kg

Soil preparation factor applied: 25x Associated Samples: all (>5x)

2nd Reviewer:

					Jun 1					ras i E
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB³ (ug/L)	Maximum ICB/CCB ^a (ug/L)		No Qual's.					
Cd	0.0050			0.0250						
Cr	0.08			0.40		 		 		
Pb	0.0200			0.1000		 			 	
Ag	0.005			0.025					<u></u>	

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 35878B4a

VALIDATION FINDINGS WORKSHEET Matrix Spike Analysis

Page:_	1 of 1
Reviewer:	MG
nd Reviewer:	9

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qua	lifications below for a	III questions answered "N	'. Not applicable que	estions are identified as "N/A".
----------------	-------------------------	---------------------------	-----------------------	----------------------------------

Y (N) N/A Was a matrix spike analyzed for each matrix in this SDG?

Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor

of 4 or more, no action was taken.

(Ŷ)N N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

F T					Rancet for recalculations.	
# Date	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
1	16	sed.	Ag	23.8	all	J/UJ/A * (all dets)
			0			
 		1				
 						
 						
		+		 		

Comments:	*	post	dia	estion	spike	in	limit	(103.4	1 9	ره)	So	no	"R'	9	ual. f	for	NDs		
		1	U					•			· · · · · · · · · · · · · · · · · · ·			U	<i></i>			 	

LDC#: 35878B4a

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: of Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA Method 6020A/7471A)

	Concentrat	tion (mg/Kg)		
Analyte	12	13	RPD (≤50)	
Arsenic	3.7	3.0	21	
Cadmium	0.0600	0.0500	18	
Chromium	19.1	13.9	32	
Copper	20.9	23.5	12	
Lead	5.78	4.93	16	
Mercury	0.025	0.03	18	
Silver	0.066	0.062	6	
Zinc	34	32	6	

V:\FIELD DUPLICATES\FD_inorganic\35878B4a.WPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 21, 2016

Parameters:

Wet Chemistry

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc./

Materials Testing & Consulting, Inc.

Sample Delivery Group (SDG): AUL1

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-8-0-2cm-160120	AUL1A	Sediment	01/20/16
JF-LTR-8-0-10cm-160120	AUL1B	Sediment	01/20/16
JF-LTR-1-0-2cm-160120	AUL1C	Sediment	01/20/16
JF-LTR-1-0-10cm-160120	AUL1D	Sediment	01/20/16
JF-LTR-13-0-2cm-160120	AUL1E	Sediment	01/20/16
JF-LTR-13-0-10cm-160120	AUL1F	Sediment	01/20/16
JF-LTR-7-0-2cm-160120	AUL1G	Sediment	01/20/16
JF-LTR-7-0-10cm-160120	AUL1H	Sediment	01/20/16
JF-LTR-2-0-2cm-160120	AUL1I	Sediment	01/20/16
JF-LTR-2-0-10cm-160120	AUL1J	Sediment	01/20/16
JF-LTR-3-0-2cm-160120	AUL1K	Sediment	01/20/16
JF-LTR-3-0-10cm-160120	AUL1L	Sediment	01/20/16
JF-LTR-103-0-10cm-160120	AUL1M	Sediment	01/20/16
JF-LTR-9-0-2-cm-160120	AUL1N	Sediment	01/20/16
JF-LTR-9-0-10cm-160120	AUL10	Sediment	01/20/16
JF-LTR-8-0-2cm-160120	AUL1P	sediment	01/20/16
JF-LTR-8-0-10cm-160120	AUL1Q	sediment	01/20/16
JF-LTR-1-0-2cm-160120	AUL1R	sediment	01/20/16
JF-LTR-1-0-10cm-160120	AUL1S	sediment	01/20/16
JF-LTR-13-0-2cm-160120	AUL1T	sediment	01/20/16
JF-LTR-13-0-10cm-160120	AUL1U	sediment	01/20/16
JF-LTR-7-0-2cm-160120	AUL1V	sediment	01/20/16
JF-LTR-7-0-10cm-160120	AUL1W	sediment	01/20/16
JF-LTR-2-0-2cm-160120	AUL1X	sediment	01/20/16
JF-LTR-2-0-10cm-160120	AUL1Y	sediment	01/20/16

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-3-0-2cm-160120	AUL1Z	sediment	01/20/16
JF-LTR-3-0-10cm-160120	AUL1AA	sediment	01/20/16
JF-LTR-103-0-10cm-160120	AUL1AB	sediment	01/20/16
JF-LTR-9-0-2-cm-160120	AUL1AC	sediment	01/20/16
JF-LTR-9-0-10cm-160120	AUL1AD	sediment	01/20/16
JF-LTR-8-0-2cm-160120MS	AUL1AMS	Sediment	01/20/16
JF-LTR-8-0-2cm-160120DUP	AUL1ADUP	Sediment	01/20/16
JF-LTR-8-0-2cm-160120TRP	AUL1ATRP	Sediment	01/20/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Grain Size by Puget Sound Estuary Protocols (PSEP) Method Specific Gravity by American Society for Testing and Materials (ASTM) D854 Total Organic Carbon by Plumb Method Total Solids by Standard Method 2540G Moisture Content by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VII. Triplicates Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

Samples JF-LTR-3-0-10cm-160120 and JF-LTR-103-0-10cm-160120 and samples JF-LTR-3-0-10cm-160120 and JF-LTR-103-0-10cm-160120 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Conce		
Analyte	JF-LTR-3-0-10cm-160120	JF-LTR-103-0-10cm-160120	RPD (Limits)
Total Organic Carbon	0.790	0.410	63 (≤50)
Total Solids	69.47	76.24	9 (≤50)

	Conce		
Analyte	JF-LTR-3-0-10cm-160120	JF-LTR-103-0-10cm-160120	RPD (Limits)
Specific gravity	2.74	2.77	1 (≤50)

	Percent Finer Than t		
Sieve Size (microns)	JF-LTR-3-0-10cm-160120	JF-LTR-103-0-10cm-160120	RPD (Limits)
#10 (2000)	99.1	98.5	1 (≤50)
#18 (1000)	97.0	96.2	1 (≤50)
#35 (500)	96.0	95.0	1 (≤50)
#60 (250)	95.5	94.0	2 (≤50)
#120 (125)	94.5	91.2	4 (≤50)
#230 (63)	88.4	75.8	15 (≤50)
31.0	70.7	56.2	23 (≤50)
15.6	45.3	36.8	21 (≤50)
7.8	27.2	22.3	20 (≤50)
3.9	16.1	13.4	18 (≤50)
2.0	11.0	9.2	18 (≤50)
1.0	7.1	6.1	15 (≤50)

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Wet Chemistry - Data Qualification Summary - SDG AUL1

No Sample Data Qualified in this SDG

Jorgensen Forge Early Action Area
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG AUL1

No Sample Data Qualified in this SDG

LDC #:	35878B6	VALIDATION COMPLETENESS WORKSHEET
SDG #:	AUL1	Level III
Laborato	ry: Analytical	Resources, Inc./Materials Testing & Consulting, Inc.

Date: 3-1-16 Page: 1 of 2 Reviewer: MG 2nd Reviewer: ___

METHOD: (Analyte) Grain Size (PSEP Method), Specific Gravity (ASTM D854), TOC (Plumb), Total Solids (SM 2540G)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
<u> </u>	Sample receipt/Technical holding times	A	
- 11	Initial calibration	A	
11.	Calibration verification	Α	
IV	Laboratory Blanks	A	
٧	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS
VII.	Duplicate sample analysis	A	TRIP
VIII.	Laboratory control samples	Α	LCS /SRM
IX.	Field duplicates	SW	D=12+13 D=27+28
X.	Sample result verification	N	
	Overall assessment of data	A	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank EB = Equipment blank

SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-8-0-2cm-160120	AUL1A	Sediment	01/20/16
2	JF-LTR-8-0-10cm-160120	AUL1B	Sediment	01/20/16
3	JF-LTR-1-0-2cm-160120	AUL1C	Sediment	01/20/16
4	JF-LTR-1-0-10cm-160120	AUL1D	Sediment	01/20/16
5	JF-LTR-13-0-2cm-160120	AUL1E	Sediment	01/20/16
6	JF-LTR-13-0-10cm-160120	AUL1F	Sediment	01/20/16
7	JF-LTR-7-0-2cm-160120	AUL1G	Sediment	01/20/16
8	JF-LTR-7-0-10cm-160120	AUL1H	Sediment	01/20/16
9	JF-LTR-2-0-2cm-160120	AUL1I	Sediment	01/20/16
10	JF-LTR-2-0-10cm-160120	AUL1J	Sediment	01/20/16
11	JF-LTR-3-0-2cm-160120	AUL1K	Sediment	01/20/16
12	JF-LTR-3-0-10cm-160120	AUL1L	Sediment	01/20/16
13_	JF-LTR-103-0-10cm-160120	AUL1M	Sediment	01/20/16
14	JF-LTR-9-0-2-cm-160120	AUL1N	Sediment	01/20/16
15	JF-LTR-9-0-10cm-160120	AUL10	Sediment	01/20/16
16	JF-LTR-8-0-2cm-160120	AUL1P	sediment	01/20/16
17	JF-LTR-8-0-10cm-160120	AUL1Q	sediment	01/20/16

LDC #:	35878B6	VALIDATION COMPLETENESS WORKSHEET	Date: 3-1-16
SDG #:_	AUL1	Level III	Page: 2 of 2
Laborato	ry: <u>Analytical Resou</u>	rces, Inc./Materials Testing & Consulting, Inc.	Reviewer: MG
		·	2nd Reviewer:

METHOD: (Analyte) Grain Size (PSEP Method), Specific Gravity (ASTM D854), TOC (Plumb), Total Solids (SM 2540G)

	Client ID	Lab ID	Matrix	Date
18	JF-LTR-1-0-2cm-160120	AUL1R	sediment	01/20/16
19	JF-LTR-1-0-10cm-160120	AUL1S	sediment	01/20/16
20	JF-LTR-13-0-2cm-160120	AUL1T	sediment	01/20/16
21	JF-LTR-13-0-10cm-160120	AUL1U	sediment	01/20/16
22	JF-LTR-7-0-2cm-160120	AUL1V	sediment	01/20/16
23	JF-LTR-7-0-10cm-160120	AUL1W	sediment	01/20/16
24	JF-LTR-2-0-2cm-160120	AUL1X	sediment	01/20/16
25	JF-LTR-2-0-10cm-160120	AUL1Y	sediment	01/20/16
26	JF-LTR-3-0-2cm-160120	AUL1Z	sediment	01/20/16
27	JF-LTR-3-0-10cm-160120	AUL1AA	sediment	01/20/16
28	JF-LTR-103-0-10cm-160120	AUL1AB	sediment	01/20/16
29	JF-LTR-9-0-2-cm-160120	AUL1AC	sediment	01/20/16
30	JF-LTR-9-0-10cm-160120	AUL1AD	sediment	01/20/16
31	JF-LTR-8-0-2cm-160120MS	AUL1AMS	Sediment	01/20/16
32	JF-LTR-8-0-2cm-160120DUP	AUL1ADUP	Sediment	01/20/16
33	JF-LTR-8-0-2cm-160120TRP	AUL1ATRP	Sediment	01/20/16
34				
35				
36				
37	PBS			

Notes:	 	 	 	
	 	 	 	 ·

LDC#:35878B6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: l of l
Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Davanatas
I T	Sed.	Parameter (To Grain)
1→15	Jea.	pH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN (TOC) CR6+ CIO, (T.S) Size
16→30		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4 (S.G.)
ec 31		pH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN (TO) CR6+ CIO,
32,33		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN (TOC) CR6+ CIO4 (T.S) (Size) GON'
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ ClO4
		ph TDS CI F NO3 NO, SO4 PO4 ALK CN' NH3 TKN TOC CR6+ CIO4
		PH TDS CIF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		ph tds ci f no3 no2 so4 po4 alk cn. nh3 tkn toc cr6+ cio4
		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph tos ci f No ₃ No ₂ So ₄ Po ₄ Alk cn Nh ₃ TKN Toc CR ⁶⁺ Cio ₄
		ph tds ci f No ₃ No ₂ So ₄ Po ₄ alk cn Nh ₃ TKN toc cr ⁶⁺ cio ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁵ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ ClO4
		PH TOS CLE NO, NO, SO, PO, ALK ON NH, TKN TOC CRS+ CIO,

Comments:	

LDC#: 35878B6

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page:_	1 of 2
Reviewer:	MG
2nd Reviewer:	<u>a</u>

Inorganics, Method See Cover

	Concentra	ition (%)		
Analyte	12	13	RPD (≤50)	
Total Organic Carbon	0.790	0.410	63	
Total Solids	69.47	76.24	9	

V:\FIELD DUPLICATES\FD_inorganic\35878B6a.WPD

	Concentration (no units)			
Analyte	27	28	RPD (≤50)	
Specific Caavity	2.74	a.77	277	

V:\FIELD DUPLICATES\FD_inorganic\35878B6a.WPD

LDC#_35878B6

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page: 2 of 2
Reviewer: MG
2nd Reviewer:

Inorganics: Method See Cover

	Percent Finer Than the Indicated Size (%)					
Sieve Size (microns)	12	13	RPD (≤50)			
3/8"	100.0	100.0	o			
#4 (4750)	100.0	100.0	0			
#10 (2000)	99.1	98.5	1			
#18 (1000)	97.0	96.2	1			
#35 (500)	96.0	95.0	1			
#60 (250)	95.5	94.0	2			
#120 (125)	94.5	91.2	4			
#230 (63)	88.4	75.8	15			
31.0	70.7	56.2	23			
15.6	45.3	36.8	21			
7.8	27.2	22.3	20			
3.9	16.1	13.4	18			
2.0	11.0	9.2	18			
1.0	7.1	6.1	15			

V:\FIELD DUPLICATES\FD_inorganic\35878B6b.wpd

LDC #: 35878

EDD POPULATION O

The LDC job number listed above was entered by

_of_1
-

	EDD Process	Y/N	Init	Comments/Action
I.	EDD Completeness	<u> </u>		
la.	- All methods present?	/	00	
lb.	- All samples present/match report?		(0)	
-lc	- All reported analytes present?		(8)	
<u>ld</u>	-10% verification of EDD?	/	(4)	
e Charles Website		444		
II.	EDD Preparation/Entry			
IIa.	- QC Level applied? (EPAStage28 or EPAStage4)	/	P	
IIb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	m		·
Kraji I			Makada S	
111.	Reasonableness Checks	_		
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	/	Q	
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	1	W	
IIIc.	- If reason codes used, do all qualified results have reason code field populated, and vice versa?	/	0	
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	ma	Ø	
IIIe.	- Were any results reported above calibration range? If so, were results qualified appropriately?	na		
IIIf.	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	/ ((3)	
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	114		
IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?	/	(Q	

Notes:	*see readme	 	 	 	 	
		 		 	 	_
			 _			

The attached zipped file contains two files:

File 1) Readme_Jorgensen_030816.doc	<u>Format</u> MS Word 2003	<u>Description</u> A "Readme" file (th	nis document).
	MS Excel 2007	A spreadsheet for the	e following SDG(s):
2) LDC35878 AUK1, AUL1 VEDD 20	0160308.xlsx	AUK1	35878A
-		AUL1	35878B

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields

March 17, 2016

SUBJECT: Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on March 2, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #35967:

SDG#

Fraction

AUR0, AUT8

Polychlorinated Biphenyls, Metals, Wet Chemistry

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

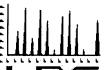
- Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area, September 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Method Data Review, October 1999
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 21, 2016

SUBJECT: Revised Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed are the revised validation reports for the fractions listed below. Please replace the previously submitted reports with the enclosed revised reports.

LDC Project #35967:

SDG # Fraction

AUR0 Polychlorinated Biphenyls

Added the rinsate to the DVR.

Wet Chemistry

Added Moisture Content by ASTM D2216.

AUT8 Wet Chemistry

Added Moisture Content by ASTM D2216.

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 21, 2016

Parameters:

Polychlorinated Biphenyls

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUR0

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-LTR-6-0-2cm-160122	AUR0A	Sediment	01/22/16
JF-LTR-6-0-10cm-160122	AUR0B	Sediment	01/22/16
JF-LTR-10-0-2cm-160122	AUR0C	Sediment	01/22/16
JF-LTR-10-0-10cm-160122	AUR0D	Sediment	01/22/16
JF-LTR-110-0-2cm-160122	AUR0E	Sediment	01/22/16
JF-LTR-18-0-2cm-160122	AUR0F	Sediment	01/22/16
JF-LTR-18-0-10cm-160122	AUR0G	Sediment	01/22/16
JF-LTR-20-0-2cm-160122	AUR0H	Sediment	01/22/16
JF-LTR-20-0-10cm-160122	AUR0I	Sediment	01/22/16
JF-PMN-1-0-2cm-160122	AUR0J	Sediment	01/22/16
JF-PMN-1-0-10cm-160122	AUR0K	Sediment	01/22/16
JF-PMN-1-0-10cm-160122DL	AUR0KDL	Sediment	01/22/16
JF-PMN-2-0-2cm-160122	AUR0L	Sediment	01/22/16
JF-PMN-2-0-10cm-160122	AUR0M	Sediment	01/22/16
JF-PMN-3-0-2cm-160122	AUR0N	Sediment	01/22/16
JF-PMN-3-0-10cm-160122	AUR00	Sediment	01/22/16
JF-Rinsate-160122	AUR0P	Water	01/22/16
JF-LTR-20-0-2cm-160122MS	AUR0HMS_	Sediment	01/22/16
JF-LTR-20-0-2cm-160122MSD	AUR0HMSD	Sediment	01/22/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and modified outlines of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008) and USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (October 1999). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to nonconformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample JF-Rinsate-160122 was identified as a rinsate. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The Aroclor-1260 result in the SRM was within the QC limits, however, the laboratory also reported Aroclor-1254 and Aroclor-1248.

IX. Field Duplicates

Samples JF-LTR-10-0-2cm-160122 and JF-LTR-110-0-2cm-160122 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentra		
Compound	JF-LTR-10-0-2cm-160122	JF-LTR-110-0-2cm-160122	RPD
Aroclor-1248	16	14	13
Aroclor-1254	31	19	48
Aroclor-1260	16	14	13

X. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
JF-PMN-1-0-10cm-160122	Aroclor-1254	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	А

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
JF-PMN-1-0-10cm-160122	Aroclor-1254	R	А

Sample	Compound	Flag	A or P
JF-PMN-1-0-10cm-160122DL	All TCL compounds except Aroclor-1254	R	А

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Data Qualification Summary - SDG AUR0

Sample	Compound	Flag	A or P	Reason
JF-PMN-1-0-10cm-160122	Aroclor-1254	R	A	Overall assessment of data
JF-PMN-1-0-10cm-160122DL	All TCL compounds except Aroclor-1254	R	А	Overall assessment of data

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG AUR0

No Sample Data Qualified in this SDG

LDC	#:	35967A3b

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

SDG #:A	JR0
Laboratory:	Analytical Resources, Inc.

Reviewer: 2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	AIA	
11.	Initial calibration/ICV	AIA	% 159/10 =20
III.	Continuing calibration	Δ	'cd ≤20
IV.	Laboratory Blanks	Δ	
V.	Field blanks	NO	R= 17
VI.	Surrogate spikes /15	Δ	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples /SRM	A/SW	LES SRM
IX.	Field duplicates	SW	0 = 3.5
X.	Compound quantitation/RL/LOQ/LODs	SW	
XI.	Target compound identification	N	
ווא	Overall assessment of data	-SW	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank
EB = Equipment blank

SB=Source blank OTHER:

L	Client ID	Lab ID	Matrix	Date
1	JF-LTR-6-0-2cm-160122	AUR0A	Sediment	01/22/16
2	JF-LTR-6-0-10cm-160122	AUR0B	Sediment	01/22/16
3	JF-LTR-10-0-2cm-160122	AUR0C	Sediment	01/22/16
4	JF-LTR-10-0-10cm-160122	AUR0D	Sediment	01/22/16
5	JF-LTR-110-0-2cm-160122	AUR0E	Sediment	01/22/16
6	JF-LTR-18-0-2cm-160122	AUR0F	Sediment	01/22/16
7	JF-LTR-18-0-10cm-160122	AUR0G	Sediment	01/22/16
8	JF-LTR-20-0-2cm-160122	AUR0H	Sediment	01/22/16
9	JF-LTR-20-0-10cm-160122	AUR0I	Sediment	01/22/16
10	JF-PMN-1-0-2cm-160122	AUR0J	Sediment	01/22/16
11	JF-PMN-1-0-10cm-160122	AUR0K	Sediment	01/22/16
12	JF-PMN-1-0-10cm-160122DL	AUR0KDL	Sediment	01/22/16
13	JF-PMN-2-0-2cm-160122	AUR0L	Sediment	01/22/16
14	JF-PMN-2-0-10cm-160122	AUR0M	Sediment	01/22/16
15	JF-PMN-3-0-2cm-160122	AUR0N	Sediment	01/22/16
16	JF-PMN-3-0-10cm-160122	AUR0O	Sediment	01/22/16
₁₇ 2	JF-Rinsate-160122	AUROP	Water	01/22/16

SDG	#:_35967A3b	Date: 3/8 Page: 1/2 of Reviewer: 2nd Reviewer:		
	Client ID	Lab iD	Matrix	Date
18	JF-LTR-20-0-2cm-160122MS	AUR0HMS	Sediment	01/22/16
19	JF-LTR-20-0-2cm-160122MSD	AUR0HMSD	Sediment	01/22/16
20				
21				
22				
23				
24				
Note	3;			
	MB - 012716			
2	MB - 012716 MB - 012916			
				- 1

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B, beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Arochlor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Arocior 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:	· · · · · · · · · · · · · · · · · · ·	 	
	<u> </u>	 	

لے ــــــــــــــــــــــــــــــــــــ	3596	7136
	V	
METHOD:	GC	HPLC

VALIDATION FINDINGS WORKSHEET <u>SRM</u>

Page:_	<u>_</u> of	<i>]</i>
Reviewer:_	FT	
2nd Reviewer:_	9	_

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A

Was SRM analyzed for each matrix in this SDG?

Y N N/A

Was the SRM recoveries within the limits?

#	SRM	Compound				Associated Samples	Qualifications
			The Aroclor-1260 result in	The Aroclor-1260 result in the standard reference material (SRM) was within			Text
			the QC limits. However, Aroclor-1248.	the laboratory also report	ted Aroclor-1254 and		
			71100101 1210.				
	_ :		<u> </u>		<u> </u>		
			· · · · · · · · · · · · · · · · · · ·				
<u>├</u>							
<u></u>	<u> </u>	· · · · · · · · · · · · · · · · · · ·					

LDC#: 35967A3b

VALIDATION FINDINGS WORKSHEET Compound Quantitation and Reported CRQLs

Page:	1 of
Reviewer:	FT
2nd Reviewer:	9

	./	
METHOD:	V _{GC}	HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N M/A

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Findings	Associated Samples	Qualifications
	ΔΔ	X'd cal Range	11	Jet 1A
		<u> </u>		
_				
-		· · · · · · · · · · · · · · · · · · ·		
-				

Comments:	See sample calculation verification worksheet for recalculations		
		 ·	

LDC#: 35967A3b

VALIDATION FINDINGS WORKSHEET <u>Overall Assessment of Data</u>

	, /
Page:	of
Reviewer:	FT
2nd Reviewer:	C

METHOD: YGC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

YN N/A Was the overall quality and usability of the data acceptable?

#	Associated samples	Compounds	Findings	Qualifications
	11	A A	x'd cal Range	P/A
			J	
	12	all except An	diluted	7/1
		`		
l				
<u> </u>		/		
				
<u> </u>				
		·		

Comments:		
	 	····

LDC#: 35967A3b

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page/of	1
Reviewer:	=7
2nd Reviewer:	2

METHOD: GC PCB (EPA SW 846 Method 8082A)

	Concentration (ug/Kg)			
Compound	3	5	RPD	
z	16	14	13	
AA	31	19	48	
ВВ	16	14	13	

V:\FIELD DUPLICATES\35967A3b.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 9, 2016

Parameters:

Metals

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUR0

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-LTR-6-0-2cm-160122	AUR0A	Sediment	01/22/16
JF-LTR-6-0-10cm-160122	AUR0B	Sediment	01/22/16
JF-LTR-10-0-2cm-160122	AUR0C	Sediment	01/22/16
JF-LTR-10-0-10cm-160122	AUR0D	Sediment	01/22/16
JF-LTR-110-0-2cm-160122	AUR0E	Sediment	01/22/16
JF-LTR-18-0-2cm-160122	AUR0F	Sediment	01/22/16
JF-LTR-18-0-10cm-160122	AUR0G	Sediment	01/22/16
JF-LTR-20-0-2cm-160122	AUR0H	Sediment	01/22/16
JF-LTR-20-0-10cm-160122	AUR0I	Sediment	01/22/16
JF-PMN-1-0-2cm-160122	AUR0J	Sediment	01/22/16
JF-PMN-1-0-10cm-160122	AUR0K	Sediment	01/22/16
JF-PMN-2-0-2cm-160122	AUR0L	Sediment	01/22/16
JF-PMN-2-0-10cm-160122	AUR0M	Sediment	01/22/16
JF-PMN-3-0-2cm-160122	AUR0N	Sediment	01/22/16
JF-PMN-3-0-10cm-160122	AUR0O	Sediment	01/22/16
JF-Rinsate-160122	AUR0P	Water	01/22/16
JF-LTR-6-0-2cm-160122MS	AUR0AMS	Sediment	01/22/16
JF-LTR-6-0-2cm-160122DUP	AUR0ADUP	Sediment	01/22/16
JF-Rinsate-160122MS	AUR0PMS	Water	01/22/16
JF-Rinsate-160122DUP	AUR0PDUP	Water	01/22/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Cadmium, Chromium, Copper, Lead, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A Mercury by EPA SW 846 Methods 7470A/7471A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium	0.06 mg/Kg	All sediment samples in SDG AUR0
PB (prep blank)	Arsenic Cadmium Chromium Silver	0.04 ug/L 0.010 ug/L 0.09 ug/L 0.010 ug/L	All water samples in SDG AUR0

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JF-Rinsate-160122	Chromium	0.27 ug/L	0.27U ug/L

VI. Field Blanks

Sample JF-Rinsate-160122 was identified as a rinsate. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
JF-Rinsate-160122	Chromium Copper Lead Zinc	0.27 0.240 0.010 0.42

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JF-LTR-6-0-2cm-160122MS (All sediment samples in SDG AUR0)	Chromium Silver	-102 (75-125) 31.9 (75-125)	J (all detects) J (all detects)	A
JF-LTR-6-0-2cm-160122MS (All sediment samples in SDG AUR0)	Mercury	128 (75-125)	J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
JF-LTR-6-0-2cm-160122DUP (All sediment samples in SDG AUR0)	Chromium	119 (≤30)	-	J (all detects)	А
JF-LTR-6-0-2cm-160122DUP (All sediment samples in SDG AUR0)	Mercury	-	0.05 mg/Kg (≤0.02)	J (all detects)	Α

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples JF-LTR-10-0-2cm-160122 and JF-LTR-110-0-2cm-160122 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentra		
Analyte	JF-LTR-10-0-2cm-160122	JF-LTR-110-0-2cm-160122	RPD
Arsenic	13.9	14.5	4
Cadmium	0.2	0.2	0
Chromium	31.6	30.7	3
Copper	40.4	39.1	3
Lead	14.2	13.1	8
Mercury	0.17	0.12	34
Silver	0.152	0.160	5
Zinc	87	87	0

XII. Internal Standards (ICP-MS)

Internal standards data were not reviewed for Stage 2B validation.

XIII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS %R and DUP RPD and difference, data were qualified as estimated in fifteen samples.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Metals - Data Qualification Summary - SDG AUR0

				<u>-</u>
Sample	Analyte	Flag	A or P	Reason
JF-LTR-6-0-2cm-160122 JF-LTR-6-0-10cm-160122 JF-LTR-10-0-2cm-160122 JF-LTR-110-0-10cm-160122 JF-LTR-110-0-2cm-160122 JF-LTR-18-0-2cm-160122 JF-LTR-20-0-2cm-160122 JF-LTR-20-0-10cm-160122 JF-PMN-1-0-2cm-160122 JF-PMN-10-10cm-160122 JF-PMN-2-0-10cm-160122 JF-PMN-2-0-10cm-160122 JF-PMN-3-0-10cm-160122 JF-PMN-3-0-10cm-160122	Chromium Silver Mercury	J (all detects) J (all detects) J (all detects)	А	Matrix spike (%R)
JF-LTR-6-0-2cm-160122 JF-LTR-6-0-10cm-160122 JF-LTR-10-0-2cm-160122 JF-LTR-110-0-10cm-160122 JF-LTR-110-0-2cm-160122 JF-LTR-18-0-10cm-160122 JF-LTR-8-0-10cm-160122 JF-LTR-20-0-10cm-160122 JF-PMN-1-0-2cm-160122 JF-PMN-1-0-10cm-160122 JF-PMN-2-0-10cm-160122 JF-PMN-2-0-2cm-160122 JF-PMN-3-0-10cm-160122 JF-PMN-3-0-10cm-160122 JF-PMN-3-0-10cm-160122	Chromium	J (all detects)	A	Duplicate sample analysis (RPD)
JF-LTR-6-0-2cm-160122 JF-LTR-6-0-10cm-160122 JF-LTR-10-0-2cm-160122 JF-LTR-10-0-10cm-160122 JF-LTR-110-0-2cm-160122 JF-LTR-18-0-10cm-160122 JF-LTR-18-0-10cm-160122 JF-LTR-20-0-2cm-160122 JF-LTR-20-0-10cm-160122 JF-PMN-1-0-2cm-160122 JF-PMN-1-0-10cm-160122 JF-PMN-10-10cm-160122 JF-PMN-2-0-2cm-160122 JF-PMN-2-0-10cm-160122 JF-PMN-3-0-10cm-160122 JF-PMN-3-0-10cm-160122	Mercury	J (all detects)	A	Duplicate sample analysis (difference)

Jorgensen Forge Early Action Area Metals - Laboratory Blank Data Qualification Summary - SDG AUR0

Sample	Analyte	Modified Final Concentration	A or P
JF-Rinsate-160122	Chromium	0.27U ug/L	А

VALIDATION COMPLETENESS WORKSHEET LDC #: 35967A4a SDG #: AUR0

Stage 2B

Reviewer: MG 2nd Reviewer:

Laboratory: Analytical Resources, Inc.

METHOD: Metals (EPA SW 846 Method 6020A/7470A/7471A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	_A	
11.	ICP/MS Tune	A	
111.	Instrument Calibration	Α	
IV.	ICP Interference Check Sample (ICS) Analysis	_A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	sw	R=16
VII.	Matrix Spike/Matrix Spike Duplicates	ઙv	Ms
VIII.	Duplicate sample analysis	SW	DUP
IX.	Serial Dilution	2	not performed
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	5	D=3+5
XII.	Internal Standard (ICP-MS)	2	not reviewed for Stage 2B
XIII.	Sample Result Verification	Z	<i>y</i>
ΧIV	Overall Assessment of Data	Α	

Note: A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1 1	JF-LTR-6-0-2cm-160122	AUR0A	Sediment	01/22/16
₂ l	JF-LTR-6-0-10cm-160122	AUR0B	Sediment	01/22/16
3	JF-LTR-10-0-2cm-160122	AUR0C	Sediment	01/22/16
4 1	JF-LTR-10-0-10cm-160122	AUR0D	Sediment	01/22/16
5 l	JF-LTR-110-0-2cm-160122	AUR0E	Sediment	01/22/16
₆	JF-LTR-18-0-2cm-160122	AUR0F	Sediment	01/22/16
7 1	JF-LTR-18-0-10cm-160122	AUR0G	Sediment	01/22/16
8	JF-LTR-20-0-2cm-160122	AUR0H	Sediment	01/22/16
9	JF-LTR-20-0-10cm-160122	AUR0i	Sediment	01/22/16
10 1	JF-PMN-1-0-2cm-160122	AUR0J	Sediment	01/22/16
11 [JF-PMN-1-0-10cm-160122	AUR0K	Sediment	01/22/16
12 1	JF-PMN-2-0-2cm-160122	AUR0L	Sediment	01/22/16
13	JF-PMN-2-0-10cm-160122	AUR0M	Sediment	01/22/16
14	JF-PMN-3-0-2cm-160122	AUR0N	Sediment	01/22/16
15	JF-PMN-3-0-10cm-160122	AUR00	Sediment	01/22/16

LDC#	: 35967A4a	

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

SDG #: AUR0 Laboratory: Analytical Resources, Inc.

Date: 3-7-16
Page: 2 of 2
Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020A/7470A/7471A)

Client ID	Lab ID	Matrix	Date
16 7 JF-Rinsate-160122	AUR0P	Water	01/22/16
17 JF-LTR-6-0-2cm-160122MS	AUR0AMS	Sediment	01/22/16
18 JF-LTR-6-0-2cm-160122DUP	AUR0ADUP	Sediment	01/22/16
19 ² JF-Rinsate-160122MS	AUR0PMS	Water	01/22/16
20 2 JF-Rinsate-160122DUP	AUR0PDUP	Water	01/22/16
21			
22			
23			
24 1 PBS			
25 7 PBW			
lotes:			

140162.	 	 		 	

LDC#: 35967A4a

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page: lof Reviewer: MG
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1->16	s/w	AI, Sb, As)Ba, Be, Cd) Ca, Cr, Co, Cu) Fe, Pb) Mg, Mn, Hg) Ni, K, Se (Ag) Na, TI, V(Zn) Mo, B, Si, CN-,
@C 17+20	V	Al, Sb, As)Ba, Be, Cd)Ca, Cr)Co, Cu)Fe, Pb) Mg, Mn, Hg) Ni, K, Se, Ag) Na, Tl, V, Zn) Mo, B, Si, CN',
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
	·····	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
100	1	Analysis Method
ICP	/	AI, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, TI, V, Zn, Mo, B, Si, CN,
		AI, Sb(As)Ba, Be, Cd)Ca(Cr)Co(Cu)Fe(Pb),Mg, Mn, Hg, Ni, K, Se,(Ag)Na, TI, V(Zn,)Mo, B, Si, CN',
GEAA L	السيييي	Al, Sh, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Ph, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, 7n, Mo, B, Si, CN

Comments: Mercury by CVAA if performed	

LDC #: <u>35967A4a</u> SDG #: <u>See Cover</u>

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Page: of Reviewer: MG
2nd Reviewer: 7

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: mg/kg

Soil preparation factor applied: 25x
Associated Samples: 1-15 (>5x)

				e s des			10.75 P. 20 10.75 P. 20			
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)		No Qual's.	·				
Cr	0.06			0.30						

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 16

								r jimeletti. Liitak			
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)		16						
As		0.04		0.20							
Cd		0.010		0.050							
Cr		0.09		0.45	0.27						
Ag		0.010		0.050						<u> </u>	

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 35967A4a

VALIDATION FINDINGS WORKSHEET Field Blanks

Page: of Page: MG Reviewer: MG 2nd reviewer:

METHOD: Tr	race Metals (EPA SW 846 Method 6010/6020/7000)	
YN N/A YN N/A	Were field blanks identified in this SDG? Were target analytes detected in the field blanks?	
Sample:	Field Blank / Trip Blank Rinsate) Other	(circle one)
	Analyte	Concentration Units (
	Cr	0.27 (Mg/L)
	Си	0-240 (1)
	Pb	0.010 ()
	Zn	0.42 ()
		
Sample:	Field Blank / Trip Blank / Rinsate / Other	(circle one)
	Analyte	Concentration Units (
	·	
·······		

LDC#: 35967A4a

VALIDATION FINDINGS WORKSHEET <u>Matrix Spike Analysis</u>

Page:_	1 of [
Reviewer:	MG
2nd Reviewer:	9

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

E	Яe	ase	see o	gualifications	below for all	questions answered "N	N". Not applicable	questions are id	lentified as "N/A".

WN N/A Was a matrix spike analyzed for each matrix in this SDG?

<u>Y (N)N/A</u> Were matrix spike percent recoveries (%R) within the control limits (75-125?) If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

i	1 10// 1		1	200 2000111	1	RSINCE TO TECANCULATIONS.		
#	Date	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifi	cations
u		17	Sed.	Cr	-102	1→15	* J/UJ/A J dets/A J/UJ/A	(all dets)
Ш				Hg	128		J dets/A	
		<u> </u>		Ag	31.9	<u> </u>	J/UJ/A	(
$\ \cdot \ $							<u> </u>	
\Vdash					<u> </u>			
╟┼								
$\ \cdot\ $								
╠┼					1			
$\ \cdot \ $					· · · · · · · · · · · · · · · · · · ·			
								The state of the s
H								
Ш								
					_			
\parallel	·							
			-					
11 1		1	Į.	!	1	l		

Comments: * post digestion spike in limit for Cr (88.37.), so no "R"qual. for N.D.5

LDC #:	35967A4	9

VALIDATION FINDINGS WORKSHEET <u>Duplicate Analysis</u>

	Page:_	of	
	Reviewer:	MG	•
2nd	Reviewer:		7

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N/A

Was a duplicate sample analyzed for each matrix in this SDG?

Y(N/N/A

Were all duplicate sample relative percent differences (RPD) \leq 20% for water samples and \leq 35% for soil samples? If no, see qualifications below. A control limit of \pm R.L. (\pm 2X R.L. for soil) was used for sample values that were \leq 5X the R.L., including the case when only one of the duplicate sample values was

<5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifica	ations
1		18	sed.	Cr	119 (£30)		1-15		(all dets)
		J	1	Hg		0.05 mg/kg (£0.0)	a)	V	()
				O		_ ~ o	· · · · · · · · · · · · · · · · · · ·		
$\ - \ $									
$\Vdash \downarrow$									
IT									
		The state of the s							
\mathbb{H}					1				
H					<u> </u>				
H									
Н									
			<u> </u>						

Comments:			

LDC#: 35967A4a_

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_	<u>i</u> of (
Reviewer:	
2nd Reviewer:	W.

METHOD: Metals (EPA Method 6020A/7470A/7471A)

	Concentrat	tion (mg/Kg)	555	
Analyte	3	5	RPD	
Arsenic	13.9	14.5	4	
Cadmium	0.2	0.2	0	
Chromium	31.6	30.7	3	
Copper	40.4	39.1	3	
Lead	14.2	13.1	8	
Mercury	0.17	0.12	34	
Silver	0.152	0.160	5	
Zinc	87	87	0	

V:\FIELD DUPLICATES\FD_inorganic\35967A4a.WPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 21, 2016

Parameters:

Wet Chemistry

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc./

Materials Testing & Consulting, Inc.

Sample Delivery Group (SDG): AUR0

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-6-0-2cm-160122	AUR0A	Sediment	01/22/16
JF-LTR-6-0-10cm-160122	AUR0B	Sediment	01/22/16
JF-LTR-10-0-2cm-160122	AUR0C	Sediment	01/22/16
JF-LTR-10-0-10cm-160122	AUR0D	Sediment	01/22/16
JF-LTR-110-0-2cm-160122	AUR0E	Sediment	01/22/16
JF-LTR-18-0-2cm-160122	AUR0F	Sediment	01/22/16
JF-LTR-18-0-10cm-160122	AUR0G	Sediment	01/22/16
JF-LTR-20-0-2cm-160122	AUR0H	Sediment	01/22/16
JF-LTR-20-0-10cm-160122	AUR0I	Sediment	01/22/16
JF-PMN-1-0-2cm-160122	AUR0J	Sediment	01/22/16
JF-PMN-1-0-10cm-160122	AUR0K	Sediment	01/22/16
JF-PMN-2-0-2cm-160122	AUR0L	Sediment	01/22/16
JF-PMN-2-0-10cm-160122	AUR0M	Sediment	01/22/16
JF-PMN-3-0-2cm-160122	AUR0N	Sediment	01/22/16
JF-PMN-3-0-10cm-160122	AUR0O	Sediment	01/22/16
JF-LTR-6-0-2cm-160122	AUR0Q	Sediment	01/22/16
JF-LTR-6-0-10cm-160122	AUR0R	Sediment	01/22/16
JF-LTR-10-0-2cm-160122	AUR0S	Sediment	01/22/16
JF-LTR-10-0-10cm-160122	AUR0T	Sediment	01/22/16
JF-LTR-110-0-2cm-160122	AUR0U	Sediment	01/22/16
JF-LTR-18-0-2cm-160122	AUR0V	Sediment	01/22/16
JF-LTR-18-0-10cm-160122	AUR0W	Sediment	01/22/16
JF-LTR-20-0-2cm-160122	AUR0X	Sediment	01/22/16
JF-LTR-20-0-10cm-160122	AUR0Y	Sediment	01/22/16
JF-PMN-1-0-2cm-160122	AUR0Z	Sediment	01/22/16

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-PMN-1-0-10cm-160122	AUR0AA	Sediment	01/22/16
JF-PMN-2-0-2cm-160122	AUR0AB	Sediment	01/22/16
JF-PMN-2-0-10cm-160122	AUR0AC	Sediment	01/22/16
JF-PMN-3-0-2cm-160122	AUR0AD	Sediment	01/22/16
JF-PMN-3-0-10cm-160122	AUR0AE	Sediment	01/22/16
JF-LTR-6-0-2cm-160122MS	AUR0AMS	Sediment	01/22/16
JF-LTR-6-0-2cm-160122DUP	AUR0ADUP	Sediment	01/22/16
JF-LTR-6-0-2cm-160122TRP	AUR0ATRP	Sediment	01/22/16
JF-PMN-1-0-2cm-160122DUP	AUR0JDUP	Sediment	01/22/16
JF-PMN-1-0-2cm-160122TRP	AUR0JTRP	Sediment	01/22/16
JF-PMN-3-0-10cm-160122DUP	AUR0AEDUP	Sediment	01/22/16
JF-PMN-3-0-10cm-160122TRP	AUR0AETRP	Sediment	01/22/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Grain Size by Puget Sound Estuary Protocols (PSEP) Method Specific Gravity by American Society for Testing and Materials (ASTM) D854 Total Organic Carbon by Plumb Method Total Solids by Standard Method 2540G Moisture Content by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VII. Triplicates Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

Samples JF-LTR-10-0-2cm-160122 and JF-LTR-110-0-2cm-160122 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concent		
Analyte	JF-LTR-10-0-2cm-160122	JF-LTR-110-0-2cm-160122	RPD
Total organic carbon	3.27	3.29	1
Total solids	38.15	37.89	1

	Conce		
Analyte	JF-LTR-10-0-2cm-160122	JF-LTR-110-0-2cm-160122	RPD
Specific Gravidy	2.74	2.68	2

	Percent Finer Than		
Sieve Size (microns)	JF-LTR-10-0-2cm-160122	JF-LTR-110-0-2cm-160122	RPD
#4 (4750)	99.7	100.0	0
#10 (2000)	98.9	97.5	1
#18 (1000)	97.1	96.2	1
#35 (500)	95.8	95.6	0
#60 (250)	94.8	95.2	0
#120 (125)	91.1	91.9	1
#230 (63)	82.1	82.7	1
(31.0)	68.2	66.5	3
(15.6)	44.9	42.6	5
(7.8)	25.3	24.0	5
(3.9)	14.5	13.7	6
(2.0)	9.6	9.3	3
(1.0)	6.1	6.5	6

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Wet Chemistry - Data Qualification Summary - SDG AUR0

No Sample Data Qualified in this SDG

Jorgensen Forge Early Action Area
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG AUR0

No Sample Data Qualified in this SDG

METHOD: (Analyte) Grain Size (PSEP Method), Specific Gravity (ASTM D854), TOC (Plumb), Total Solids (SM 2540G)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	Α	
Ш	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	Ms
VII.	Duplicate sample analysis	Α	TRIP
VIII.	Laboratory control samples	Α	LCS/SRM
IX.	Field duplicates	5W	D=3+5 D=18+20
Χ.	Sample result verification	N	
ΧI	Overall assessment of data	_ A	

Note: A = Acceptable N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-6-0-2cm-160122	AUR0A	Sediment	01/22/16
2	JF-LTR-6-0-10cm-160122	AUR0B	Sediment	01/22/16
3	JF-LTR-10-0-2cm-160122	AUR0C	Sediment	01/22/16
4	JF-LTR-10-0-10cm-160122	AUR0D	Sediment	01/22/16
5	JF-LTR-110-0-2cm-160122	AUR0E	Sediment	01/22/16
6	JF-LTR-18-0-2cm-160122	AUR0F	Sediment	01/22/16
7	JF-LTR-18-0-10cm-160122	AUR0G	Sediment	01/22/16
8	JF-LTR-20-0-2cm-160122	AUR0H	Sediment	01/22/16
9	JF-LTR-20-0-10cm-160122	AUR01	Sediment	01/22/16
10	JF-PMN-1-0-2cm-160122	AUR0J	Sediment	01/22/16
11	JF-PMN-1-0-10cm-160122	AUR0K	Sediment	01/22/16
12	JF-PMN-2-0-2cm-160122	AUR0L	Sediment	01/22/16
13	JF-PMN-2-0-10cm-160122	AUR0M	Sediment	01/22/16
14	JF-PMN-3-0-2cm-160122	AUR0N	Sediment	01/22/16
15	JF-PMN-3-0-10cm-160122	AUR0O	Sediment	01/22/16
16	JF-LTR-6-0-2cm-160122	AUR0Q	Sediment	01/22/16
17	JF-LTR-6-0-10cm-160122	AUR0R	Sediment	01/22/16

LDC #:_	35967A6	VALIDATION COMPLETENESS WORKSHEET	Date: 3-8-1
SDG #:_	AUR0	Level III	Page: 2 of 2
Laborato	ry: Analytical Resour	ces, Inc./Materials Testing & Consulting, Inc.	Reviewer: MG
		·	2nd Reviewer:

METHOD: (Analyte) Grain Size (PSEP Method), Specific Gravity (ASTM D854), TOC (Plumb), Total Solids (SM 2540G)

	Client ID	Lab ID	Matrix	Date
18	JF-LTR-10-0-2cm-160122	AUR0S	Sediment	01/22/16
19	JF-LTR-10-0-10cm-160122	AUR0T	Sediment	01/22/16
20	JF-LTR-110-0-2cm-160122	AUR0U	Sediment	01/22/16
21	JF-LTR-18-0-2cm-160122	AUR0V	Sediment	01/22/16
22	JF-LTR-18-0-10cm-160122	AUR0W	Sediment	01/22/16
23	JF-LTR-20-0-2cm-160122	AUR0X	Sediment	01/22/16
24	JF-LTR-20-0-10cm-160122	AUROY	Sediment	01/22/16
25	JF-PMN-1-0-2cm-160122	AUR0Z	Sediment	01/22/16
26	JF-PMN-1-0-10cm-160122	AUR0AA	Sediment	01/22/16
27	JF-PMN-2-0-2cm-160122	AUR0AB	Sediment	01/22/16
28	JF-PMN-2-0-10cm-160122	AUR0AC	Sediment	01/22/16
29	JF-PMN-3-0-2cm-160122	AUR0AD	Sediment	01/22/16
30	JF-PMN-3-0-10cm-160122	AUR0AE	Sediment	01/22/16
31	JF-LTR-6-0-2cm-160122MS	AUR0AMS	Sediment	01/22/16
32	JF-LTR-6-0-2cm-160122DUP	AUR0ADUP	Sediment	01/22/16
33	JF-PMN-1-0-2cm-160122DUP	AUR0JDUP	Sediment	01/22/16
34	JF-PMN-1-0-2cm-160122TRP	AUR0JTRP	Sediment	01/22/16
35	JF-PMN-3-0-10cm-160122DUP	AUR0AEDUP	Sediment	01/22/16
36	JF-PMN-3-0-10cm-160122TRP	AUR0AETRP	Sediment	01/22/16
37	#1 TRP			
38				
39				
1 0				
11	PBS			

Notes:	 	 	 	 	

LDC#: 35967A6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	of
Reviewer:	MG
2nd reviewer:	01

All circled methods are applicable to each sample.

Samula ID	Matrix	D
Sample ID	Matrix	Parameter Co (Grain)
1 → 15	sed	pH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN (TOC) CRS+ CIO, TS Size
16 → 30		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄ (Sp. Grav)
ac 31		pH TDS CI F NO3 NO, SO4 PO4 ALK CN NH3 TKN (TOC) CR8+ CIO4
39,37		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN (TOC) CR CO4 (TS)
33,34		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ClO ₄ Grain Size Sp.
₹ 35,36	_ L	pH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CR CIO, Grav.
		ph tds cif no3 no2 so4 po4 alk cn nh3 tkn toc cr6+ cio4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ ClO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
	į	ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁸⁺ CIO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN' NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+ ClO.
		pH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR ⁶⁺ ClO.
		PH TDS CLF NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ ClO ₄
 		pH TDS CLE NO. NO. SO, PO, ALK CN NH. TKN TOC CR6+ CIO.

Comments:	 ····	

LDC#: 35967A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_	1 of 2
Reviewer:	MG
2nd Reviewer:	a

Inorganics, Method See Cover

	Concentration (%)			
Analyte	3	5	RPD (≤50)	
Total Organic Carbon	3.27	3,29	1	
Total Solids	38.15	37.89	1	

V:\FIELD DUPLICATES\FD_inorganic\35967A6a.WPD

	Concentratio			
Analyte	18	20	RPD (≥60)	
Specific Gravity	2.74	2.68	2	

V:\FIELD DUPLICATES\FD_inorganic\35967A6a.WPD

LDC#<u>35967A6</u>

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: 2 of 2
Reviewer: MG
2nd Reviewer:

Inorganics: Method See Cover

	Percent Finer Than	the Indicated Size (%)		
Sieve Size (microns)	3 5		RPD (560)	
3/8"	100.0	100:0	0	2
#4 (4750)	99.7	100.0	0	
#10 (2000)	98.9	97.5	1	
#18 (1000)	97.1	96.2	1	
#35 (500)	95.8	95.6	0	
#60 (250)	94.8	95.2	0	
#120 (125)	91.1	91.9	1	
#230 (63)	82.1	82.7	1	
(31.0)	68.2	66.5	3	
(15.6	44.9	42.6	5	
(7.8)	25.3	24.0	5	
(3.9)	14.5	13.7	6	
(2.0)	9.6	9.3	3	
(1.0)	6.1	6.5	6	

V:\FIELD DUPLICATES\FD_inorganic\35967A6b.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 8, 2016

Parameters:

Polychlorinated Biphenyls

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUT8

Comple Identification	Laboratory Sample Identification	Maduise	Collection
Sample Identification		Matrix	Date
JF-LTR-4-0-2cm-160125	AUT8A	Sediment	01/25/16
JF-LTR-4-0-10cm-160125	AUT8B	Sediment	01/25/16
JF-LTR-19-0-2cm-160125	AUT8C	Sediment	01/25/16
JF-LTR-19-0-10cm-160125	AUT8D	Sediment	01/25/16
JF-LTR-21-0-2cm-160125	AUT8E	Sediment	01/25/16
JF-LTR-21-0-10cm-160125	AUT8F	Sediment	01/25/16
JF-LTR-12-0-2cm-160125	AUT8G	Sediment	01/25/16
JF-LTR-12-0-10cm-160125	AUT8H	Sediment	01/25/16
JF-PMN-4-0-2cm-160125	AUT8I	Sediment	01/25/16
JF-PMN-4-0-10cm-160125	AUT8J	Sediment	01/25/16
JF-PMU-1-0-2cm-160125	AUT8K	Sediment	01/25/16
JF-PMU-1-0-10cm-160125	AUT8L	Sediment	01/25/16
JF-PMU-2-0-2cm-160125	AUT8M	Sediment	01/25/16
JF-PMU-2-0-10cm-160125	AUT8N	Sediment	01/25/16
JF-RINSATE-160125	AUT8O	Water	01/25/16
JF-DOCK DECON-160125	AUT8P	Water	01/25/16
JF-PMN-4-0-10cm-160125MS	AUT8JMS	Sediment	01/25/16
JF-PMN-4-0-10cm-160125MSD	AUT8JMSD	Sediment	01/25/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and modified outlines of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008) and USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (October 1999). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples JF-RINSATE-160125 was identified as an rinsate. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Affected Compound	Flag	A or P
JF-PMN-4-0-10cm-160125MS/MSD (JF-PMN-4-0-10cm-160125)	Aroclor-1260	44.7 (50-150)	49.0 (50-150)	Aroclor-1242 Aroclor-1248 Aroclor-1254 Aroclor-1260	J (all detects) UJ (all non-detects)	А

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The Aroclor-1260 result in the SRM was within the QC limits, however, the laboratory also reported Aroclor-1254 and Aroclor-1248.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Data Qualification Summary - SDG AUT8

Sample	Compound	Flag	A or P	Reason
JF-PMN-4-0-10cm-160125	Aroclor-1242 Aroclor-1248 Aroclor-1254 Aroclor-1260	J (all detects) UJ (all non-detects)	А	Matrix spike/Matrix spike duplicate (%R)

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG AUT8

No Sample Data Qualified in this SDG

VALIDATION COMPLETENESS WORKSHEET LDC #: 35967B3b SDG #: AUT8

Stage 2B

Date: 3/8/16
Page: <u>/</u> of 2
Reviewer:
2nd Reviewer:

Laboratory: Analytical Resources, Inc.

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	AIA	
II.	Initial calibration/ICV	A/Δ	% PSD/101 = 20
JII.	Continuing calibration	Α	cal = 20
IV.	Laboratory Blanks	A	
V.	Field blanks	SWIM	R= 15, 10
VI.	Surrogate spikes / \>	1/4	· ·
VII.	Matrix spike/Matrix spike duplicates	یںی	
VIII.	Laboratory control samples /SRM	A/5W	LCS , SRM
IX.	Field duplicates	'N	
X.	Compound quantitation/RL/LOQ/LODs	N	
XI.	Target compound identification	N	
L XII	Overall assessment of data		

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

★ ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-4-0-2cm-160125	AUT8A	Sediment	01/25/16
2	JF-LTR-4-0-10cm-160125	AUT8B	Sediment	01/25/16
3	JF-LTR-19-0-2cm-160125	AUT8C	Sediment	01/25/16
4	JF-LTR-19-0-10cm-160125	AUT8D	Sediment	01/25/16
5	JF-LTR-21-0-2cm-160125	AUT8E	Sediment	01/25/16
6	JF-LTR-21-0-10cm-160125	AUT8F	Sediment	01/25/16
7	JF-LTR-12-0-2cm-160125	AUT8G	Sediment	01/25/16
8	JF-LTR-12-0-10cm-160125	AUT8H	Sediment	01/25/16
9	JF-PMN-4-0-2cm-160125	AUT8I	Sediment	01/25/16
10	JF-PMN-4-0-10cm-160125	AUT8J	Sediment	01/25/16
11	JF-PMU-1-0-2cm-160125	AUT8K	Sediment	01/25/16
12_	JF-PMU-1-0-10cm-160125	AUT8L	Sediment	01/25/16
13	JF-PMU-2-0-2cm-160125	AUT8M	Sediment	01/25/16
14	JF-PMU-2-0-10cm-160125	AUT8N	Sediment	01/25/16
15	JF-RINSATE-160125	AUT8O	Water	01/25/16
+ 16	JF-DOCK DECON-160125	AUT8P	Water	01/25/16
17	JF-PMN-4-0-10cm-160125MS	AUT8JMS	Sediment	01/25/16

SDG Labo	#:_35967B3b VALIDATION COMPLETENESS #:_AUT8 Stage 2B pratory:_Analytical Resources, Inc. THOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)		R 2nd R	Date: 2/8/16 Page: 2 of 2 Reviewer: F7 Reviewer:
	Client ID	Lab ID	Matrix	Date
18	JF-PMN-4-0-10cm-160125MSD	AUT8JMSD	Sediment	01/25/16
19				
20				
21				
22	,			
23_				
Note	s:			
_	MB-1012916			
	MB- 020 116			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Arochior 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Arocior-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:	 	 	 	

LDC #:_	35	96	7B	36
---------	----	----	----	----

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Page:	of
Reviewer:	<u>F</u> T
2nd Reviewer:	9

METHOD: HPLC

Y/N/N/A

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? N_N/A

Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound		VIS Limits)		MSD (Limits)		RPD (Limits)		Associated Samples	Qualifications
	17418	BB	44.7	(20-15)	49.0	(50-15	0	()	10	J/41/A (ND+DE) qual Y, Z, AA, BB
				()		()	()		qual Y, Z, AA, BB
				()		()	()		Y=NO
			<u> </u>	()		()	()		2, AA, BB = Det
<u> </u>				()		()	()		
<u> </u>		= 78.50	<u> </u>	()	1	()	()		
<u> </u>	·····			()		(()		
 				()		()	()		
)	(()	()		
				()		()	()		
				()		()	()		
				()		()	()		
				()		()	()		
				()		()	()		
				()		()	()		,
				()		()	(.)		
				(()	()		
				()		()	()		
				()		()	()		
				(()	()		
				(()	()		
				(()	()		
				(()	()		
				(()	()		

LDC #:	35 96	78	3/
--------	-------	----	----

VALIDATION FINDINGS WORKSHEET <u>SRM</u>

Page:_	<u>/</u> of
Reviewer:_	FT
2nd Reviewer:_	9

METHOD: /GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was SRM analyzed for each matrix in this SDG? Y N/A Y N N/A

Was the SRM recoveries within the limits?

#_	SRM	Compound				Associated Samples	Qualifications
			The Aroclor-1260 result in the QC limits. However,	the standard reference mate	erial (SRM) was within		Text
<u> </u>			Aroclor-1248.	the laboratory also report	ed Alocioi-1254 and		
		41					·
			<u> </u>				
<u> </u>				_			
ļ							
<u> </u>							· ·
				-9140			
<u> </u>							

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 21, 2016

Parameters:

Wet Chemistry

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc./

Materials Testing & Consulting, Inc.

Sample Delivery Group (SDG): AUT8

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-4-0-2cm-160125	AUT8A	Sediment	01/25/16
JF-LTR-4-0-10cm-160125	AUT8B	Sediment	01/25/16
JF-LTR-19-0-2cm-160125	AUT8C	Sediment	01/25/16
JF-LTR-19-0-10cm-160125	AUT8D	Sediment	01/25/16
JF-LTR-21-0-2cm-160125	AUT8E	Sediment	01/25/16
JF-LTR-21-0-10cm-160125	AUT8F	Sediment	01/25/16
JF-LTR-12-0-2cm-160125	AUT8G	Sediment	01/25/16
JF-LTR-12-0-10cm-160125	AUT8H	Sediment	01/25/16
JF-PMN-4-0-2cm-160125	AUT8I	Sediment	01/25/16
JF-PMN-4-0-10cm-160125	AUT8J	Sediment	01/25/16
JF-PMU-1-0-2cm-160125	AUT8K	Sediment	01/25/16
JF-PMU-1-0-10cm-160125	AUT8L	Sediment	01/25/16
JF-PMU-2-0-2cm-160125	AUT8M	Sediment	01/25/16
JF-PMU-2-0-10cm-160125	AUT8N	Sediment	01/25/16
JF-LTR-4-0-2cm-160125	AUT8Q	Sediment	01/25/16
JF-LTR-4-0-10cm-160125	AUT8R	Sediment	01/25/16
JF-LTR-19-0-2cm-160125	AUT8T	Sediment	01/25/16
JF-LTR-19-0-10cm-160125	AUT8U	Sediment	01/25/16
JF-LTR-21-0-2cm-160125	AUT8V	Sediment	01/25/16
JF-LTR-21-0-10cm-160125	AUT8W	Sediment	01/25/16
JF-LTR-12-0-2cm-160125	AUT8X	Sediment	01/25/16
JF-LTR-12-0-10cm-160125	AUT8Y	Sediment	01/25/16
JF-LTR-4-0-2cm-160125	AUT8Z	Sediment	01/25/16
JF-PMN-4-0-10cm-160125	AUT8AA	Sediment	01/25/16
JF-PMN-1-0-2cm-160125	AUT8AB	Sediment	01/25/16

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-PMU-1-0-10cm-160125	AUT8AC	Sediment	01/25/16
JF-PMU-2-0-2cm-160125	AUT8AD	Sediment	01/25/16
JF-PMU-2-0-10cm-160125	AUT8AE	Sediment	01/25/16
JF-LTR-4-0-2cm-160125MS	AUT8AMS	Sediment	01/25/16
JF-LTR-4-0-2cm-160125DUP	AUT8ADUP	Sediment	01/25/16
JF-LTR-4-0-2cm-160125TRP	AUT8ATRP	Sediment	01/25/16
JF-PMU-1-0-2cm-160125DUP	AUT8KDUP	Sediment	01/25/16
JF-PMU-1-0-2cm-160125TRP	AUT8KTRP	Sediment	01/25/16
JF-LTR-12-0-2cm-160125DUP	AUT8XDUP	Sediment	01/25/16
JF-LTR-12-0-2cm-160125TRP	AUT8XTRP	Sediment	01/25/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Grain Size by Puget Sound Estuary Protocols (PSEP) Method Specific Gravity by American Society for Testing and Materials (ASTM) D854 Total Organic Carbon by Plumb Method Total Solids by Standard Method 2540G Moisture Content by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VII. Triplicates Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Wet Chemistry - Data Qualification Summary - SDG AUT8

No Sample Data Qualified in this SDG

Jorgensen Forge Early Action Area Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG AUT8

No Sample Data Qualified in this SDG

LDC #: 35967B6	VALIDATION COMPLETENESS WORKSHEET	Date: <u>3-8-1</u> 6
SDG #:AUT8	Level III	Page: 1 of 2
Laboratory: Analytical Reso	purces, Inc./Materials Testing & Consulting, Inc.	Page: 1 of 2 Reviewer: MG
•		2nd Reviewer:

METHOD: (Analyte) Grain Size (PSEP Method), Specific Gravity (ASTM D854), TOC (Plumb), Total Solids (SM 2540G)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l	Sample receipt/Technical holding times	A	
11	Initial calibration	Α	
111.	Calibration verification	Α	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	Ms
VII.	Duplicate sample analysis	A	TRIP
VIII.	Laboratory control samples	A_	LCS / SRM
IX.	Field duplicates	7	
Χ	Sample result verification	N	
XI	Overall assessment of data	<u> </u>	

Note: A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

Lab ID Matrix Date Client ID AUT8A Sediment 01/25/16 JF-LTR-4-0-2cm-160125 01/25/16 AUT8B Sediment JF-LTR-4-0-10cm-160125 JF-LTR-19-0-2cm-160125 AUT8C Sediment 01/25/16 JF-LTR-19-0-10cm-160125 AUT8D Sediment 01/25/16 JF-LTR-21-0-2cm-160125 AUT8E Sediment 01/25/16 5 AUT8F JF-LTR-21-0-10cm-160125 Sediment 01/25/16 6 AUT8G 01/25/16 Sediment JF-LTR-12-0-2cm-160125 AUT8H 01/25/16 8 JF-LTR-12-0-10cm-160125 Sediment JF-PMN-4-0-2cm-160125 AUT8I Sediment 01/25/16 9 10 JF-PMN-4-0-10cm-160125 AUT8J Sediment 01/25/16 **AUT8K** Sediment 01/25/16 11 JF-PMU-1-0-2cm-160125 12 AUT8L Sediment 01/25/16 JF-PMU-1-0-10cm-160125 **M8TUA** Sediment 01/25/16 JF-PMU-2-0-2cm-160125 AUT8N Sediment 01/25/16 14 JF-PMU-2-0-10cm-160125 JF-LTR-4-0-2cm-160125 AUT8Q Sediment 01/25/16 15 16 JF-LTR-4-0-10cm-160125 AUT8R Sediment 01/25/16 JF-LTR-19-0-2cm-160125 **T8TUA** Sediment 01/25/16

	Client ID	Lab ID		=
18		Lab ib	Matrix	Date
	JF-LTR-19-0-10cm-160125	AUT8U	Sediment	01/25/16
19	JF-LTR-21-0-2cm-160125	AUT8V	Sediment	01/25/16
20	JF-LTR-21-0-10cm-160125	AUT8W	Sediment	01/25/16
21	JF-LTR-12-0-2cm-160125	AUT8X	Sediment	01/25/16
22	JF-LTR-12-0-10cm-160125	AUT8Y	Sediment	01/25/16
23	JF-LTR-4-0-2cm-160125	AUT8Z	Sediment	01/25/16
24	JF-PMN-4-0-10cm-160125	AUT8AA	Sediment	01/25/16
25	JF-PMN-1-0-2cm-160125	AUT8AB	Sediment	01/25/16
26 .	JF-PMU-1-0-10cm-160125	AUT8AC	Sediment	01/25/16
27 .	JF-PMU-2-0-2cm-160125	AUT8AD	Sediment	01/25/16
28 .	JF-PMU-2-0-10cm-160125	AUT8AE	Sediment	01/25/16
29 .	JF-LTR-4-0-2cm-160125MS	AUT8AMS	Sediment	01/25/16
30 .	JF-LTR-4-0-2cm-160125DUP	AUT8ADUP	Sediment	01/25/16
31	JF-PMU-1-0-2cm-160125DUP	AUT8KDUP	Sediment	01/25/16
32 .	JF-PMU-1-0-2cm-160125TRP	AUT8KTRP	Sediment	01/25/16
33	IF-LTR-12-0-2cm-160125DUP	AUT8XDUP	Sediment	01/25/16
34	IF-LTR-12-0-2cm-160125TRP	AUT8XTRP	Sediment	01/25/16
	#ITRP			

2

38

Notes:

PBS

LDC#:35967B6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: of Page: MG
Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter Parameter
1->14	Sed	pH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN (FOC) CR6+ CIO, (F3) (Grain) Size
15 → 28		PH TDS CI F NO, NO, SO, PO, ALK CN-NH, TKN TOC CR CIO, (5 G)
oc 29		PH TDS CI F NO, NO, SO4 PO4 ALK CN NH, TKN TOC CR5+ CIO4
30,35		pH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CR CIO, TS
31,32		pH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CR CIO, (Grain)
₹ 33,34		PH TDS CI F NO3 NO, SO4 PO4 ALK CN' NH3 TKN TOC CRS+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph tds ci f NO3 NO2 SO4 PO4 ALK CN" NH3 TKN TOC CR6+ CIO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR8 CIO4
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph tds ci f no, no, so, po, alk cn nh, tkn toc cre+ cio,
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph tds ci f no3 no2 so4 po4 alk cn nh3 tkn toc cr6+ cio4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		PH TDS CLF NO3 NO, SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		PH TDS CLF NO3 NO, SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph tds ci f no, no, so, po, alk cn nh, tkn toc cre+ cio,
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLE NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+ CIO,

Comments:	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 9, 2016

Parameters:

Metals

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUT8

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-4-0-2cm-160125	AUT8A	Sediment	01/25/16
JF-LTR-4-0-10cm-160125	AUT8B	Sediment	01/25/16
JF-LTR-19-0-2cm-160125	AUT8C	Sediment	01/25/16
JF-LTR-19-0-10cm-160125	AUT8D	Sediment	01/25/16
JF-LTR-21-0-2cm-160125	AUT8E	Sediment	01/25/16
JF-LTR-21-0-10cm-160125	AUT8F	Sediment	01/25/16
JF-LTR-12-0-2cm-160125	AUT8G	Sediment	01/25/16
JF-LTR-12-0-10cm-160125	AUT8H	Sediment	01/25/16
JF-PMN-4-0-2cm-160125	AUT8I	Sediment	01/25/16
JF-PMN-4-0-10cm-160125	AUT8J	Sediment	01/25/16
JF-PMU-1-0-2cm-160125	AUT8K	Sediment	01/25/16
JF-PMU-1-0-10cm-160125	AUT8L	Sediment	01/25/16
JF-PMU-2-0-2cm-160125	AUT8M	Sediment	01/25/16
JF-PMU-2-0-10cm-160125	AUT8N	Sediment	01/25/16
JF-RINSATE-160125	AUT8O	Water	01/25/16
JF-DOCK DECON-160125	AUT8P	Water	01/25/16
JF-LTR-4-0-2cm-160125MS	AUT8AMS	Sediment	01/25/16
JF-LTR-4-0-2cm-160125DUP	AUT8ADUP	Sediment	01/25/16
JF-RINSATE-160125MS	AUT8OMS	Water	01/25/16
JF-RINSATE-160125DUP	AUT8ODUP	Water	01/25/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Cadmium, Chromium, Copper, Lead, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A Mercury by EPA SW 846 Methods 7470A/7471A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Lead . Mercury	0.0050 mg/Kg 0.00083 mg/Kg	All sediment samples in SDG AUT8
PB (prep blank)	Cadmium Chromium Lead Silver	0.010 ug/L 0.09 ug/L 0.010 ug/L 0.010 ug/L	All water samples in SDG AUT8

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JF-RINSATE-160125	Chromium	0.20 ug/L	0.20U ug/L

VI. Field Blanks

Sample JF-RINSATE-160125 was identified as a rinsate. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
JF-RINSATE-160125	Arsenic Chromium Copper Lead Zinc	0.3 0.20 0.360 0.7 0.87

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JF-LTR-4-0-2cm-160125MS (All sediment samples in SDG AUT8)	Arsenic Chromium Copper Lead Zinc	139 (75-125) 244 (75-125) 815 (75-125) 275 (75-125) 138 (75-125)	J (all detects)	A
JF-LTR-4-0-2cm-160125MS (All sediment samples in SDG AUT8)	Silver	70.1 (75-125)	J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
JF-LTR-4-0-2cm-160125DUP (All sediment samples in SDG AUT8)	Copper Lead	42.4 (≤30) 52.0 (≤30)	- - -	J (all detects) J (all detects)	A

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standards data were not reviewed for Stage 2B validation.

XIII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS %R and DUP RPD, data were qualified as estimated in fourteen samples.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Metals - Data Qualification Summary - SDG AUT8

Sample	Analyte	Flag	A or P	Reason
JF-LTR-4-0-2cm-160125 JF-LTR-4-0-10cm-160125 JF-LTR-19-0-2cm-160125 JF-LTR-19-0-10cm-160125 JF-LTR-21-0-2cm-160125 JF-LTR-21-0-10cm-160125 JF-LTR-12-0-2cm-160125 JF-PMN-4-0-2cm-160125 JF-PMN-4-0-10cm-160125 JF-PMU-1-0-2cm-160125 JF-PMU-1-0-10cm-160125 JF-PMU-1-0-10cm-160125 JF-PMU-1-0-10cm-160125 JF-PMU-1-0-10cm-160125 JF-PMU-1-0-10cm-160125 JF-PMU-2-0-10cm-160125	Arsenic Chromium Copper Lead Zinc Silver	J (all detects)	A	Matrix spike (%R)
JF-LTR-4-0-2cm-160125 JF-LTR-4-0-10cm-160125 JF-LTR-19-0-2cm-160125 JF-LTR-19-0-10cm-160125 JF-LTR-21-0-10cm-160125 JF-LTR-21-0-10cm-160125 JF-LTR-12-0-2cm-160125 JF-PMN-4-0-2cm-160125 JF-PMN-4-0-10cm-160125 JF-PMU-1-0-2cm-160125 JF-PMU-1-0-2cm-160125 JF-PMU-1-0-10cm-160125 JF-PMU-1-0-10cm-160125 JF-PMU-1-0-10cm-160125 JF-PMU-2-0-2cm-160125 JF-PMU-2-0-10cm-160125	Copper Lead	J (all detects) J (all detects)	Α	Duplicate sample analysis (RPD)

Jorgensen Forge Early Action Area Metals - Laboratory Blank Data Qualification Summary - SDG AUT8

Sample	Analyte	Modified Final Concentration	A or P
JF-RINSATE-160125	Chromium	0.20U ug/L	А

LDC #:_	35967B4a	VAL
SDG #:	AUT8	

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Laboratory: Analytical Resources, Inc.

Page: 1 of 2

Reviewer: MG

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020A/7470A/7471A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
<u>l</u> .	Sample receipt/Technical holding times	Α	
IJ.	ICP/MS Tune	Α	
111.	Instrument Calibration	_A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	R=15
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS
VIII.	Duplicate sample analysis	SW	DUP
IX.	Serial Dilution	7	not performed
X.	Laboratory control samples	Α	LCS
XI.	Field Duplicates	7	
XII.	Internal Standard (ICP-MS)	7	not reviewed for Stage 2B
XIII.	Sample Result Verification	N	
XIV	Overall Assessment of Data	Α	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate

TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1 1	JF-LTR-4-0-2cm-160125	AUT8A	Sediment	01/25/16
2 1	JF-LTR-4-0-10cm-160125	AUT8B	Sediment	01/25/16
₃ 1	JF-LTR-19-0-2cm-160125	AUT8C	Sediment	01/25/16
4 1	JF-LTR-19-0-10cm-160125	AUT8D	Sediment	01/25/16
₅ 1	JF-LTR-21-0-2cm-160125	AUT8E	Sediment	01/25/16
6 I	JF-LTR-21-0-10cm-160125	AUT8F	Sediment	01/25/16
₇ {	JF-LTR-12-0-2cm-160125	AUT8G	Sediment	01/25/16
₈ 1	JF-LTR-12-0-10cm-160125	AUT8H	Sediment	01/25/16
9 l	JF-PMN-4-0-2cm-160125	AUT8!	Sediment	01/25/16
₁₀ (JF-PMN-4-0-10cm-160125	AUT8J	Sediment	01/25/16
11	JF-PMU-1-0-2cm-160125	AUT8K	Sediment	01/25/16
₁₂ l	JF-PMU-1-0-10cm-160125	AUT8L	Sediment	01/25/16
13	JF-PMU-2-0-2cm-160125	AUT8M	Sediment	01/25/16
14	JF-PMU-2-0-10cm-160125	AUT8N	Sediment	01/25/16
15 2	JF-RINSATE-160125	AUT8O	Water	01/25/16

LDC #:	35967B4a	VALIDATION COMPLETENESS WORKSHEET
	00001010	

Stage 2B

Page: 2 of Reviewer: M(2nd Reviewer: _______

SDG #: AUT8 Laboratory: Analytical Resources, Inc.

METHOD: Metals (EPA SW 846 Method 6020A/7470A/7471A)

Client ID	Lab ID	Matrix	Date
16 7 JF-DOCK DECON-160125	AUT8P	Water	01/25/16
17 JF-LTR-4-0-2cm-160125MS	AUT8AMS	Sediment	01/25/16
18 JF-LTR-4-0-2cm-160125DUP	AUT8ADUP	Sediment	01/25/16
19 7 JF-RINSATE-160125MS	AUT8OMS	Water	01/25/16
20 7 JF-RINSATE-160125DUP	AUT8ODUP	Water	01/25/16
21			
22			
23			
24 1 785			
257 PBW			
lotes:			

LDC#: 35967B4a

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page: of Page: MG

Reviewer: MG

2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1->16	5/W	Al, Sb.(As) Ba, Be,(Cd) Ca(Cr)Co,(Cu) Fe(Pb) Mg, Mn,(Hg) Ni, K, Se,(Ag) Na, Tl, V(Zn) Mo, B, Si, CN-
QC17+20	I	Al, Sb(As)Ba, Be, Cd,Ca(Cr)Co,Cu)Fe(Pb) Mg, Mn(Hg) Ni, K, Se,(Ag)Na, Tl, V(Zn)Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
	<u>(</u>	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
	Į[Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
	ll l	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
ICB	T T	Analysis Method
ICP-MS	- (/	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe (Pb) Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
GFAA		
JEAAL		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN',

Comments Mercury by CVAA if performed

LDC #: <u>35967B4a</u> SDG #: <u>See Cover</u>

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Page: of Reviewer: MG
2nd Reviewer: 9

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: mg/kg

Soil preparation factor applied: 25x
Associated Samples: 1-14 (>5x)

	- 22 s 1200 01 - 442 s 1				r maganakéhi 2000 na 2000 sa nahili			i ya ya ya ka		
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)		No Qual's.					
Pb	0.0050			0.0250						
Hg	0.00083			0.00415						

Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 15,16 Analyte Maximum Maximum Maximum Action ICB/CCB^a PB^a PB^a Limit 15 (mg/Kg) (ug/L) (ug/L) 0.050 0.010 Cd 0.09 0.45 0.20 Cr Pb 0.010 0.050 0.050 0.010 Ag

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 35967 B4a

VALIDATION FINDINGS WORKSHEET Field Blanks

Reviewer: 2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

ØN N/A ØN N/A

Were field blanks identified in this SDG?

Were target analytes detected in the field blanks?

Sample: _

Field Blank / Trip Blank / Rinsate) Other____(circle one)

Analyte	Concer Units	
As	0.3	(Mg/L)
Cr	0.20	(1)
Cu	0.360	()
Pb	0.7	()
Zn	0.87	()

Field Blank / Trip Blank / Rinsate / Other_____ (circle one) Sample: ____

Analyte	Concentration Units (はし)
A ₅	21.0
Co	0,3
	25
Cu	53,2
Pb	23,3
Ha	0.1
13	0,700
	41

LDC#: 35967B4a

VALIDATION FINDINGS WORKSHEET Matrix Spike Analysis

Page:_	of(_
Reviewer:	MG
2nd Reviewer:	9

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a matrix spike analyzed for each matrix in this SDG?

Was a matrix spike analyzed for each matrix in this SDG?

Y(N)N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor

of 4 or more, no action was taken.

(V)N N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

	1 14// \	TTOTO TODAIDAIACO TOSC	ite acceptable:	OCC ECVCITY	Coalculation voi	KSHEEL IOI TECAICUIALIONS.		
#	Date	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	9	ualifications
		17	sed	As	139	1-14	J dets/A	(all dets)
			1	Cr	244			
				Cu	815			
				РЬ	275		1	
			1	Ag	70.1		J/UJ/A	
		4	J J	Zn	138	4	J dets / A	(1)
\vdash	·		 					
屵			<u> </u>	<u> </u>				
\Vdash								
$\ \cdot \ $.,,
計								
H								
H								
			ļ					
								
			1					

Comments:			

LDC#: 35967 B4a

VALIDATION FINDINGS WORKSHEET Duplicate Analysis

Page:_	of
Reviewer:	MG
2nd Reviewer.	_ a

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y)N N/A Was a duplicate sample analyzed for each matrix in this SDG? Y (N) N/A

Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of +R.L. (+2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was

<5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. Duplicate ID Matrix Analyte RPD (Limits) Qualifications Date Difference (Limits) Associated Samples 42.4 (530) J/UJ/A (all dets) 18 sed Cu ->14 52.00 Pb

Comments:		

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

The LDC job number listed above was entered by

2nd Reviewer:

	EDD Process	Y/N	Init	Comments/Action
l.	EDD Completeness	-		
la.	- All methods present?	/	W	
lb.	- All samples present/match report?	V	W	
lc.	- All reported analytes present?		(1)	
ld	-10% verification of EDD?		(3)	
de de la companya de	THE STATE OF THE S	100 05 S		
II.	EDD Preparation/Entry			
lia.	- QC Level applied? (EPAStage2B or EPAStage4)		W	
IIb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	m	Ø	
111.	Reasonableness Checks	_		
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	✓	0	
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	/	(9	
IIIc.	- If reason codes used, do all qualified results have reason code field populated, and vice versa?			
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?		Q	
IIIe.	- Were any results reported above calibration range? If so, were results qualified appropriately?	79+	0	
IIIf.	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	/	(1)	
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	r		
llih.	- Is the detect flag set to "N" for all "U" qualified blank results?	/	N	
Notes <u>:</u>	*see readme			

	entry columns blank for these results?			
IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?	/	N	
Notes <u>:</u>	*see readme			

The attached zipped file contains two files:

<u>File</u>

1) Readme_Jorgensen_031416.doc	MS Word 2003	A "Readme" file (this document).				
	MS Excel 2007	A spreadsheet for the	following SDG(s):			
2) LDC35967_AUR0,AUT8_VEDD_20	160311.xlsx	AUR0	35967A			
		AUT8	35967B			

Description

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.

Format



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 17, 2016

SUBJECT: Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed is the final validation report for the fractions listed below. This SDG was received on March 7, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #35991:

SDG#

Fraction

8MVA

Polychlorinated Biphenyls, Metals, Wet Chemistry

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area, September 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Method Data Review, October 1999
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist



2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 17, 2016

SUBJECT: Revised Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed is the revised validation report for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

LDC Project #35991:

SDG # Fraction

AVM8 Wet Chemistry

Added Moisture Content by ASTM D2216.

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist

	EDD Stage	e 2B		LD	C #	359	991	(A	nch	or	En	viro	nn	nen	tal	Se	attl	e V	VA	/ Jo	orge	ens	en	Fo	rge	: E/	AA)										
LDC	SDG#	DATE REC'D	(3) DATE DUE	PC (808	Bs 32A)	Met (602 /747	20A	Gra Siz (PSI	ze	Spe Gra (D8	vitv	TO (Plui	C nb)	Tot Soli (254	ds l																						
Matrix	k: Water/Sedimen	ıt :		w	s	w		w	s	w	s	w				w	s	w	s	w	s	w	s	w	s	w	s	W	s	W	s	w	s	W	s	w	S
Α	AVM8	03/07/16	03/28/16	0	9	0	9	0	9	0	9	0	9	0	9																				_		_
		ļ		ļ																						<u> </u>											_
\sqcup		ļ	ļ	<u> </u>		<u></u>																				Щ								\dashv	_	$\sqcup \downarrow$	_
				<u> </u>																														\vdash			_
		<u> </u>		<u> </u>																					_									\square	_	<u> </u>	_
	<u></u>	<u> </u>		<u> </u>	L_	<u> </u>									_	_						<u> </u>		<u> </u>	_											\sqcup	_
				<u> </u>															_						_										\dashv	\sqcup	_
		ļ		<u> </u>																				<u> </u>				<u> </u>						\vdash		\vdash	_
\sqcup		ļ							_															ļ	<u>.</u>											\vdash	_
							_			<u> </u>																								-	_	\vdash	_
ļ	<u> </u>			<u> </u>						<u> </u>									_			_	_				_							\vdash	_		_
\vdash		 	<u> </u>	-	 	<u> </u>			_	<u> </u>													_	<u> </u>		_	<u> </u>							\vdash	_		_
 			<u> </u>	_	ļ	-	<u> </u>		_											_							<u> </u>				_			$\vdash \vdash$	\dashv	\vdash	_
		<u> </u>		_	<u> </u>	├—	_	<u> </u>		<u> </u>										<u> </u>		_			 									$\vdash \vdash$	\dashv		_
$\vdash \vdash$				-	<u> </u>	-	<u> </u>	ļ	_	<u> </u>									_	<u> </u>		├		<u> </u>					_					 	\dashv	\vdash	_
$\vdash \vdash$		<u> </u>	<u> </u>	-	<u> </u>	 	<u> </u>												_			├							 					\vdash	\dashv	$\vdash \dashv$	_
$\vdash \vdash$		 	 		-		├		-			_							_		ļ	-		<u> </u>	 				<u> </u>					$\vdash\vdash$	\dashv	\vdash	_
		 		-		-	┢	-	-	-	\vdash								-			├		-		-	-				-			\vdash		\vdash	_
$\vdash \vdash$		 		 	├-		-			_	-	_							┢			┢┈		-	 	<u> </u>			_		-			H	\dashv	\vdash	_
					-		\vdash		 	-									┢	-	<u> </u>	┢		-	 	-		ļ <u>.</u>	-		-			\vdash	\dashv	\vdash	_
-		-		1	-	-	├		-	-									┢		-	╁─		-	-	-					┢╌			\vdash	\dashv	\vdash	_
				╁─	╁╌		├─	-		├─		_							├-			\vdash		┢	\vdash	 	-	_	-		-				\dashv	\vdash	_
			<u> </u>	╁		┢	\vdash		-													-		┢	┢		\vdash		├─		-			\vdash	\dashv	\vdash	_
-			 	1	-	╁	┢		-	-												-		┢	 	╁		-	-		-					\vdash	_
	 _		 	\vdash	\vdash	\vdash			-	-									-			H	 	┢╌		 		├~	-		_	 		\vdash	\dashv	\vdash	_
\vdash			 	t	-	\vdash		\vdash	 	\vdash									┢	 	\vdash	t	_	├-	\vdash	\vdash					 		\vdash	-		\vdash	_
$\ \cdot\ $			 	+	-	\vdash		\vdash	├─	\vdash		-	 						├-	1	1	\dagger		\vdash	\vdash	 				\vdash				$\mid \neg \mid$		$\vdash \dashv$	_
				+	\vdash	+-	 	\vdash	H	-	_	-							一	-		t^-	-	\vdash			 		_		\vdash			H		$\vdash \vdash$	_
 	<u></u>	 		+	\vdash	\vdash		\vdash	t	\vdash									\vdash			t^-		 	 	t		\vdash	 		 			H		\vdash	_
Total	T/CR		 -	0	9	0	9	0	9	<u>_</u>	9	0	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 11, 2016

Parameters:

Polychlorinated Biphenyls

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AVM8

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-LTR-1-0-60cm-160201	AVM8A	Sediment	02/01/16
JF-LTR-5-0-34cm-160201	AVM8B	Sediment	02/01/16
JF-LTR-5-34-60cm-160201	AVM8C	Sediment	02/01/16
JF-LTR-19-0-60cm-160202	AVM8D	Sediment	02/02/16
JF-LTR-13-0-60cm-160202	AVM8E	Sediment	02/02/16
JF-LTR-2-0-60cm-160202	AVM8F	Sediment	02/02/16
JF-LTR-6-0-60cm-160202	AVM8G	Sediment	02/02/16
JF-LTR-5-0-18cm-160203	AVM8H	Sediment	02/03/16
JF-LTR-5-18-52cm-160203	AVM8I	Sediment	02/03/16
JF-LTR-5-18-52cm-160203MS	AVM8IMS	Sediment	02/03/16
JF-LTR-5-18-52cm-160203MSD	AVM8IMSD	Sediment	02/03/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and modified outlines of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008) and USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (October 1999). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Column	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
JF-LTR-5-18-52cm-160203	Not specified	Decachlorobiphenyl	169 (40-126)	All TCL compounds	J (all detects)	Р

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The Aroclor-1260 result in the SRM was within the QC limits, however, the laboratory also reported Aroclor-1254.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to surrogate %R, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Data Qualification Summary - SDG AVM8

Sample	Compound	Flag	A or P	Reason
JF-LTR-5-18-52cm-160203	All TCL compounds	J (all detects)	Р	Surrogate spikes (%R)

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG AVM8

No Sample Data Qualified in this SDG

SDG Labo	#:35991A3b VALIDATI #:AVM8 ratory:Analytical Resources, Inc. HOD: GC Polychlorinated Biphenyls (El	Sta	age 2B	SS WORKSHI		Date: 3/10 Page: lof Reviewer: p
The	samples listed below were reviewed for ation findings worksheets.				idation findings are	noted in attached
	Validation Area			C	omments	
1.	Sample receipt/Technical holding times	4/4				
11.	Initial calibration/ICV	Α .Δ	0/0	PSD /ICV	£ 20	
III.	Continuing calibration	Δ		PSD / VCV	= 20	
IV.	Laboratory Blanks	A				
V.	Field blanks	N				
VI.	Surrogate spikes / 15	2//w				
VII.		A'				
VIII	1 - 1	AM	K2	SRM		
IX.	Field duplicates	N				
X.	Compound quantitation/RL/LOQ/LODs	N				
Xł.	Target compound identification	N				
LXII	Overall assessment of data	A				
Note:	N = Not provided/applicable R = F	= No compounds d Rinsate : Field blank	letected	D = Duplicate TB = Trip blank EB = Equipmer	OTHER:	rce blank
	Client ID			Lab ID	Matrix	Date
1	JF-LTR-1-0-60cm-160201 -			AVM8A	Sediment	02/01/16
2	JF-LTR-5-0-34cm-160201 /			AVM8B	Sediment	02/01/16
3	JF-LTR-5-34-60cm-160201 _			AVM8C	Sediment	02/01/16
4	JF-LTR-19-0-60cm-160202			AVM8D	Sediment	02/02/16
5	JF-LTR-13-0-60cm-160202/			AVM8E	Sediment	02/02/16
6	JF-LTR-2-0-60cm-160202-			AVM8F	Sediment	02/02/16
7	JF-LTR-6-0-60cm-160202/			AVM8G	Sediment	02/02/16
8	JF-LTR-5-0-18cm-160203 >			AVM8H	Sediment	02/03/16
9	JF-LTR-5-18-52cm-160203 /		AVM8I	Sediment	02/03/16	
10	JF-LTR-5-18-52cm-160203MS			AVM8IMS	Sediment	02/03/16
11	JF-LTR-5-18-52cm-160203MSD			AVM8IMSD	Sediment	02/03/16
12						
13						
14						
Notes	:					

L:\Anchor\Jorgensen\35991A3bW.wpc	ł
E. V WOODO WOOD COO IT WOOD TO THE	

MB-020916

LDC#: 3599143b

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

Page:_	100
raye	+01/
Reviewer:_	<u> </u>
2nd Reviewer:	9

METHOD: VGC

Are surrogates required by the method? Yes____ or No_

Phase see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Hexacosane

Bromobenzene

Were surrogates spiked into all samples and blanks?

N/N/A Did all surrogate recoveries (%R) meet the QC limits?

#_	Sample ID		Detect Colum		Surrogate Compound			Limits	5)			Qu	alifications
	MB-020916		NS	•	9'		128	(40 -	126	Jan	19	(UU)
								()		7	
								()			
	9		N	5	Θ		169	(40.	- 126	Jan	1/8	ND+Det
								()			
								()			
		· · · · · · · · · · · · · · · · · · ·)			
								(
								()			
								()			
								()			
								()			
								()			
				- , .				()			
								()			
								()			
								()			
								()	_		
								()			
								(
								. ()			
	Surrogate Compo	und		Surrog	ate Compound		Surrogate Compour	ıd		Surrogate C	ompound		
A	Chlorobenzene (CB	Z)	G	O	ctacosane	М	Benzo(e)Pyrene		s	1-Chloro-3-Nit	robenzene	Υ	Tetrachloro-m- xylene
В	4-Bromofluorobenzene	(BFB)	Н	Ort	no-Terphenyl	N	Terphenyi-D14		T_	3,4-Dinitro	toluene	z	2-Bromonaphthalene
C,	a,a,a-Trifluorotoluer		1		benzene (FBZ)	0	Decachlorobiphenyl (DC	B)	U_	Tripent		AA	Chloro-octadecane
D	Bromochlorobenen	ie	J	n-	Triacontane	Р	1-methylnaphthalene		V	Tri-n-pro	pyltin	BB	2,4-Dichlorophenylacetic acid

Dichlorophenyl Acetic Acid (DCAA)

4-Nitrophenol

W

Tributyl Phosphate

Triphenyl Phosphate

CC

2,5-Dibromotoluene

1,4-Dichlorobutane

1.4-Difluorobenzene (DFB)

LDC #:	359	91A	36
--------	-----	-----	----

VALIDATION FINDINGS WORKSHEET <u>SRM</u>

Page:_	<u>/</u> of
Reviewer:_	FT
2nd Reviewer:_	9

METHOD: $\underline{\mathscr{V}}$ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Y N N/A Was SRM analyzed for each matrix in this SDG? Was the SRM recoveries within the limits?

#	SRM	Compound				Associated Samples	Qualifications
			The Aroclor-1260 result in the standard reference material (SRM) was within the QC limits. However, the laboratory also reported Aroclor-1254.				Text
_			the QC limits. However, the la	iboratory also reported A	Arocioi-1254.		
		**-					
				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
		L					<u> </u>

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 11, 2016

Parameters:

Metals

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AVM8

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-LTR-1-0-60cm-160201	AVM8A	Sediment	02/01/16
JF-LTR-5-0-34cm-160201	AVM8B	Sediment	02/01/16
JF-LTR-5-34-60cm-160201	AVM8C	Sediment	02/01/16
JF-LTR-19-0-60cm-160202	AVM8D	Sediment	02/02/16
JF-LTR-13-0-60cm-160202	AVM8E	Sediment	02/02/16
JF-LTR-2-0-60cm-160202	AVM8F	Sediment	02/02/16
JF-LTR-6-0-60cm-160202	AVM8G	Sediment	02/02/16
JF-LTR-5-0-18cm-160203	AVM8H	Sediment	02/03/16
JF-LTR-5-18-52cm-160203	AVM8I	Sediment	02/03/16
JF-LTR-1-0-60cm-160201MS	AVM8AMS	Sediment	02/01/16
JF-LTR-1-0-60cm-160201DUP	AVM8ADUP	Sediment	02/01/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Cadmium, Chromium, Copper, Lead, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A Mercury by EPA SW 846 Method 7471A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Cadmium Chromium Lead Mercury Zinc	0.0100 mg/Kg 0.04 mg/Kg 0.0050 mg/Kg 0.00083 mg/Kg 0.20 mg/Kg	All samples in SDG AVM8

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JF-LTR-1-0-60cm-160201	Cadmium	0.0462 mg/Kg	0.0462U mg/Kg
	Mercury	0.00163 mg/Kg	0.00163U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
JF-LTR-5-0-34cm-160201	Cadmium	0.0358 mg/Kg	0.0358U mg/Kg
JF-LTR-19-0-60cm-160202	Cadmium Mercury	0.0350 mg/Kg 0.00247 mg/Kg	0.0350U mg/Kg 0.00247U mg/Kg
JF-LTR-2-0-60cm-160202	Cadmium	0.0370 mg/Kg	0.0370U mg/Kg

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JF-LTR-1-0-60cm-160201MS (All samples in SDG AVM8)	Chromium Copper	64.8 (75-125) 66.4 (75-125)	J (all detects) J (all detects)	A
JF-LTR-1-0-60cm-160201MS (All samples in SDG AVM8)	Zinc	129 (75-125)	J (all detects)	A

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standards data were not reviewed for Stage 2B validation.

XIII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS %R, data were qualified as estimated in nine samples.

Due to laboratory blank contamination, data were qualified as not detected in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Metals - Data Qualification Summary - SDG AVM8

Sample	Analyte	Flag	A or P	Reason
JF-LTR-1-0-60cm-160201 JF-LTR-5-0-34cm-160201 JF-LTR-5-34-60cm-160201 JF-LTR-19-0-60cm-160202 JF-LTR-13-0-60cm-160202 JF-LTR-2-0-60cm-160202 JF-LTR-6-0-60cm-160202 JF-LTR-5-0-18cm-160203 JF-LTR-5-18-52cm-160203	Chromium Copper Zinc	J (all detects) J (all detects) J (all detects)	A	Matrix spike (%R)

Jorgensen Forge Early Action Area Metals - Laboratory Blank Data Qualification Summary - SDG AVM8

Sample	Analyte	Modified Final Concentration	A or P
JF-LTR-1-0-60cm-160201	Cadmium Mercury	0.0462U mg/Kg 0.00163U mg/Kg	А
JF-LTR-5-0-34cm-160201	Cadmium	0.0358U mg/Kg	A
JF-LTR-19-0-60cm-160202	Cadmium Mercury	0.0350U mg/Kg 0.00247U mg/Kg	Α
JF-LTR-2-0-60cm-160202	Cadmium	0.0370U mg/Kg	А

VALIDATION COMPLETENESS WORKSHEET

Stage 2B SDG #: AVM8

Reviewer:_M 2nd Reviewer:

Laboratory: Analytical Resources, Inc.

LDC #: 35991A4a

METHOD: Metals (EPA SW 846 Method 6020A/7471A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	Ą	
II.	ICP/MS Tune	A	
Ш.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	2	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS
VIII.	Duplicate sample analysis	Α	DUP
IX.	Serial Dilution	N	not performed
X.	Laboratory control samples	Α	LCS
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	N	not reviewed for Stage 28
XIII.	Sample Result Verification	N	,
ΧIV	Overall Assessment of Data	A	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-1-0-60cm-160201	AVM8A	Sediment	02/01/16
2	JF-LTR-5-0-34cm-160201	AVM8B	Sediment	02/01/16
3	JF-LTR-5-34-60cm-160201	AVM8C	Sediment	02/01/16
4	JF-LTR-19-0-60cm-160202	AVM8D	Sediment	02/02/16
5	JF-LTR-13-0-60cm-160202	AVM8E	Sediment	02/02/16
6	JF-LTR-2-0-60cm-160202	AVM8F	Sediment	02/02/16
7	JF-LTR-6-0-60cm-160202	AVM8G	Sediment	02/02/16
8	JF-LTR-5-0-18cm-160203	AVM8H	Sediment	02/03/16
9	JF-LTR-5-18-52cm-160203	AVM8I	Sediment	02/03/16
10	JF-LTR-1-0-60cm-160201MS	AVM8AMS	Sediment	02/01/16
11	JF-LTR-1-0-60cm-160201DUP	AVM8ADUP	Sediment	02/01/16
12				
13				
14	PBS			

Notes:

LDC#: 35991A4a

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	<u>of</u>
Reviewer:	MG
2nd reviewer:	a_

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-39	Sed	Al, Sb, As)Ba, Be, Cd) Ca, Cc, Co, Cu) Fe, Pb) Mg, Mn, Hg) Ni, K, Se, Ag) Na, Tl, V, Zn) Mo, B, Si, CN',
QC 10,11		Al, Sb,(As) Ba, Be,(Cd) Ca,(Cr)Co,(Cu)Fe,(Pb)Mg, Mn,(Hg)Ni, K, Se,(Ag)Na, Tl, V(Zn) Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sì, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Analysis Method
ICP		AI, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
ICP-MS	sed	Al, Sb,As, Ba, Be,Cd)Ca,Cr)Co,Cu)Fe,Pb)Mg, Mn, Hg, Ni, K, Se,Ag)Na, Tl, V,Cn)Mo, B, Si, CN ⁻ ,
GEAA		Al Sb As Ba Be Cd Ca Cr Co Cu Fe Pb Mg Mn Hg Ni K Se Ag Na Tl V Zn Mo B Si CN

Comments: Mercury by CVAA if performed			
	ALL WATER TO THE PARTY OF THE P	 	

LDC #: <u>35991A4a</u> SDG #: <u>See Cover</u>

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 25x

Associated Samples: all

Reviewer: 2nd Reviewer:

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: __mg/kg___

					A COLUMN						
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)		1	2	4	6			
Cd	0.0100			0.0500	0.0462	0.0358	0.0350	0.0370			
Cr	0.04			0.20							
Pb	0.0050			0.0250					 		
Hg	0.00083			0.00415	0.00163		0.00247				
Zn	0.20			1.00							

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 29, 2016

Parameters:

Wet Chemistry

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc./

Materials Testing & Consulting, Inc.

Sample Delivery Group (SDG): AVM8

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-1-0-60cm-160201	AVM8A	Sediment	02/01/16
JF-LTR-5-0-34cm-160201	AVM8B	Sediment	02/01/16
JF-LTR-5-34-60cm-160201	AVM8C	Sediment	02/01/16
JF-LTR-19-0-60cm-160202	AVM8D	Sediment	02/02/16
JF-LTR-13-0-60cm-160202	AVM8E	Sediment	02/02/16
JF-LTR-2-0-60cm-160202	AVM8F	Sediment	02/02/16
JF-LTR-6-0-60cm-160202	AVM8G	Sediment	02/02/16
JF-LTR-5-0-18cm-160203	AVM8H	Sediment	02/03/16
JF-LTR-5-18-52cm-160203	AVM8I	Sediment	02/03/16
JF-LTR-1-0-60cm-160201	AVM8J	Sediment	02/01/16
JF-LTR-5-0-34cm-160201	AVM8K	Sediment	02/01/16
JF-LTR-5-34-60cm-160201	AVM8L	Sediment	02/01/16
JF-LTR-19-0-60cm-160202	AVM8M	Sediment	02/02/16
JF-LTR-13-0-60cm-160202	AVM8N	Sediment	02/02/16
JF-LTR-2-0-60cm-160202	AVM8O	Sediment	02/02/16
JF-LTR-6-0-60cm-160202	AVM8P	Sediment	02/02/16
JF-LTR-5-18-52cm-160203	AVM8Q	Sediment	02/03/16
JF-LTR-1-0-60cm-160201MS	AVM8AMS	Sediment	02/01/16
JF-LTR-1-0-60cm-160201DUP	AVM8ADUP	Sediment	02/01/16
JF-LTR-5-34-60cm-160201DUP	AVM8CDUP	Sediment	02/01/16
JF-LTR-5-34-60cm-160201TRP	AVM8CTRP	Sediment	02/01/16
JF-LTR-1-0-60cm-160201TRP	AVM8ATRP	Sediment	02/01/16
JF-LTR-5-34-60cm-160201DUP	AVM8LDUP	Sediment	02/01/16
JF-LTR-5-34-60cm-160201TRP	AVM8LTRP	Sediment	02/01/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Grain Size by Puget Sound Estuary Protocols (PSEP) Method Specific Gravity by American Society for Testing and Materials (ASTM) D854 Total Organic Carbon by Plumb Method Total Solids by Standard Method 2540G Moisture Content by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VII. Triplicates Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

TRP ID (Associated Samples)	Analyte	%RSD (Limits)	Flag	A or P
JF-LTR-1-0-60cm-160201TRP (JF-LTR-1-0-60cm-160201 JF-LTR-5-0-34cm-160201 JF-LTR-5-34-60cm-160201 JF-LTR-19-0-60cm-160202 JF-LTR-13-0-60cm-160202 JF-LTR-2-0-60cm-160202 JF-LTR-5-0-60cm-160202 JF-LTR-5-0-18cm-160203 JF-LTR-5-0-18cm-160203	Total organic carbon	59.5 (≤30)	J (all detects)	A

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to triplicate %RSD, data were qualified as estimated in nine samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Wet Chemistry - Data Qualification Summary - SDG AVM8

Sample	Analyte	Flag	A or P	Reason
JF-LTR-1-0-60cm-160201 JF-LTR-5-0-34cm-160201 JF-LTR-5-34-60cm-160201 JF-LTR-19-0-60cm-160202 JF-LTR-13-0-60cm-160202 JF-LTR-2-0-60cm-160202 JF-LTR-6-0-60cm-160202 JF-LTR-5-0-18cm-160203 JF-LTR-5-18-52cm-160203	Total organic carbon	J (all detects)	A	Triplicate sample analysis (%RSD)

Jorgensen Forge Early Action Area Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG AVM8

No Sample Data Qualified in this SDG

LDC #:	35991A6	_ VALIDATION COMPLETENESS WORKSHEET	Date: 3-10-16
SDG #:_	AVM8	_ Level III	Page: 1 of 2
Laborato	ry: Analytical Resou	urces, Inc./Materials Testing & Consulting, Inc.	Reviewer: MG
			2nd Reviewer:

METHOD: (Analyte) Grain Size (PSEP Method), Specific Gravity (ASTM D854), TOC (Plumb), Total Solids (SM 2540G)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l	Sample receipt/Technical holding times	A	·
II	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	Α	
V	Field blanks	N	
Vi.	Matrix Spike/Matrix Spike Duplicates	A	MS
VII.	Duplicate sample analysis	SW	TRIP
VIII.	Laboratory control samples	Α	LCS/SRM
IX.	Field duplicates	N	
X.	Sample result verification	N	
_XL	Overall assessment of data	$\perp A$	

Note:

A = Acceptable N = Not provided/applicable SW = See worksheet

ND = No compounds detected R = Rinsate

FB = Field blank

D = Duplicate TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-1-0-60cm-160201	AVM8A	Sediment	02/01/16
2	JF-LTR-5-0-34cm-160201	AVM8B	Sediment	02/01/16
3	JF-LTR-5-34-60cm-160201	AVM8C	Sediment	02/01/16
4	JF-LTR-19-0-60cm-160202	AVM8D	Sediment	02/02/16
5	JF-LTR-13-0-60cm-160202	AVM8E	Sediment	02/02/16
6	JF-LTR-2-0-60cm-160202	AVM8F	Sediment	02/02/16
7	JF-LTR-6-0-60cm-160202	AVM8G	Sediment	02/02/16
8	JF-LTR-5-0-18cm-160203	AVM8H	Sediment	02/03/16
9	JF-LTR-5-18-52cm-160203	AVM8I	Sediment	02/03/16
10	JF-LTR-1-0-60cm-160201	AVM8J	Sediment	02/01/16
11	JF-LTR-5-0-34cm-160201	AVM8K	Sediment	02/01/16
12	JF-LTR-5-34-60cm-160201	AVM8L	Sediment	02/01/16
13	JF-LTR-19-0-60cm-160202	AVM8M	Sediment	02/02/16
14	JF-LTR-13-0-60cm-160202	AVM8N	Sediment	02/02/16
15	JF-LTR-2-0-60cm-160202	AVM8O	Sediment	02/02/16
6	JF-LTR-6-0-60cm-160202	AVM8P	Sediment	02/02/16
7	JF-LTR-5-18-52cm-160203	AVM8Q	Sediment	02/03/16

SDC Labo	#:35991A6 VALIDATION CC #:AVM8 pratory: Analytical Resources, Inc./Materials Test THOD: (Analyte) Grain Size (PSEP Method), Spe		F 2nd F	Date: 3-10- Page: 2 of 3 Reviewer: MG Reviewer: ds (SM 2540G)
	Client ID	Lab ID	Matrix	Date
18	JF-LTR-1-0-60cm-160201MS	AVM8AMS	Sediment	02/01/16
19	JF-LTR-1-0-60cm-160201DUP	AVM8ADUP	Sediment	02/01/16
20	JF-LTR-5-34-60cm-160201DUP	AVM8CDUP	Sediment	02/01/16
21	JF-LTR-5-34-60cm-160201TRP	AVM8CTRP	Sediment	02/01/16
22	# I TRP			
23	#12DUP			
24	# 12 TRP			
25	PBS (
26	PBS2			
VIOTA	o:			

LDC #: 3599 1A6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: ___of __ Reviewer: ______ 2nd reviewer: _____

All circled methods are applicable to each sample.

	M	
Sample ID	<u> Matrix</u>	Parameter (Grain)
1->9	Sed	pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CRE+ CIO4 TS Size
10-717		PH TDS CIF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4 SG
Qc 18		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN (TOC) CR6+ CIO4
19,22		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN (TOC) CR6+ CIO4 (T3)
20.21		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4 Grain
\$ 23,24	1	PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
	-	PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ CIO4
		ph tds ci f no, no, so, po, alk cn nh, tkn toc cr ⁶⁺ cio,
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph tds ci f no, no, so, po, alk cn nh, tkn toc cr6+ cio,
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO, SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR5+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		PH TDS CLE NO. NO. SO, PO, ALK CN. NH. TKN TOC CR6+ CIO.

Comments:	

LDC#:	35	99	l	A6	

VALIDATION FINDINGS WORKSHEET

Triplicate Duplicate-Analysis

Page:_	Lof_	
Reviewer:		
2nd Reviewer:	0	

METHOD: Inorganics, Method_

See cover

9M/4

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Was a duplicate sample analyzed for each matrix in this SDG?

YNA

Were all duplicate sample relative percent differences (RPD) ≤ 20% for water and ≤ 35% for soil samples (≤ 10% for Method 300.0)? If no, see qualification below. A control limit of ±CRDL (±2X CRDL for soil) was used for samples that were ≤5X the CRDL, including when only one of the duplicate sample values were ≤5X the CRDL. If field blanks were used for laboratory duplicates, see overall assessment.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations

	14//				recalculation workshe	ot for recalculations.	
		Triplicate			50 RST	1	
#	Date	Triplicate D	Matrix	Analyte	90 RSD BPD (Limits)	Associated Samples	Qualifications
					-0 - 11 - 5		1 - 1 - 1 - 1 - 1
lí		(1, 19, 22)	Sed.	TOC	59.5 (430)	att 1-9	J/UJ/A (all dets)
	-					\ - \ - \ - \ - \ - \ \ - \	
Į .							
<u> </u>							
		Į į					
1		1					
\vdash	·	†					
L							<u> </u>
<u> </u>							
h	1	1				1	
-		†				 	
		<u></u>					
		!					
II	ļ					1	
l	 					 	
1	ļ			-		1	i
<u> </u>		<u> </u>					· · · · · · · · · · · · · · · · · · ·
H						1	
 			 		I	†	
1		1	1		1		•
		1	1				
I	L					<u> </u>	
ll	i			1		1	
 	1	 	 			 	
11	1	ļ	1	1			
	1						
II	<u> </u>				ļ		
1	1	1		1			
⊩	<u> </u>	 	 	<u> </u>		 	<u> </u>
IL	<u> </u>	<u> </u>	1	1	1	<u> </u>	

Comments:			 	
	 	·		

LDC#: 35991A4a

VALIDATION FINDINGS WORKSHEET <u>Matrix Spike Analysis</u>

Page:_	1_of_[
Reviewer:	MG
nd Reviewer:	G

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identifie					
EXEASE SEE QUARRICAROUS DEROW TOL AR QUESTIONS ANSWELED. IN INDITABLE COESTIONS ALE QUERTINE	Jianea eaa ai	sualifications bolow for all	augetions answered "N"	Not applicable augotions	ara idantifiad on "NI/A"
	HEASE SEE U	Juanilications below to all	uuesiions answered iv .	INUL ADDITICADIE GUESTIOLIS	sale lucillilleu as IVA.

Was a matrix spike analyzed for each matrix in this SDG?

Y(N)N/A Were matrix spike percent recoveries (%R) within the control limits o(75-125?) If the sample concentration exceeded the spike concentration by a factor

of 4 or more, no action was taken.

Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Date	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Out I Mark San
 	Date			Cr	64.8		Qualifications
Щ		10	Sed	2		all	J/UJ/A (all dets)
Ш			11	Cu	66.4		<u> </u>
		7	1 1	Zn	129	<u> </u>	J dets/A
П							
			1				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
H			1				
\parallel			1				
$\parallel \rightarrow \parallel$							
\parallel			1				
H							
H							
					-		
\parallel							
Ш							

Comments:				

LDC #: 75-991

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

The LDC job number listed above was entered by 4.

	EDD Process	Y/N	Init	Comments/Action
l.	EDD Completeness			
la.	- All methods present?	/	a	
lb.	- All samples present/match report?	1	W	
lc.	- All reported analytes present?	/	U	
ld	-10% verification of EDD?	/	4	
II.	EDD Preparation/Entry	<u> </u>		
IIa.	- QC Level applied? (EPAStage2B or EPAStage4)	/	W	
IIb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	na	(V)	
pida.				
111.	Reasonableness Checks			
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	na	(
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	/	P	
IIIc.	- If reason codes used, do all qualified results have reason code field populated, and vice versa?	/	9	
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	✓	(2)	
IIIe.	- Were any results reported above calibration range? If so, were results qualified appropriately?	M	2	
IIIf.	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	V	0	
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	No	0	
IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?	$ \sqrt{ } $		

Notes:_	*see read	<u>me</u>				
				-		
	· ·					

The attached zipped file contains two files:

File Format Description
1) Readme Jorgensen_031416.doc MS Word 2003 A "Readme" file (this document).

MS Excel 2007 A spreadsheet for the following SDG(s):

2) LDC35991_AVM8_VEDD_20160311.xlsx AVM8 35991A

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.

LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 17, 2016

SUBJECT: Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed is the final validation report for the fractions listed below. This SDG was received on March 9, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #36007:

SDG # Fraction

AUN8 Polychlorinated Biphenyls, Metals, Wet Chemistry

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area, September 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Method Data Review, October 1999
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 21, 2016

SUBJECT: Revised Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed is the revised validation report for the fraction listed below. Please replace the previously submitted report with the enclosed revised report.

LDC Project #36007:

SDG#

Fraction

8NUA

Polychlorinated Biphenyls, Metals, Wet Chemistry

• Added Moisture Content by ASTM D2216.

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist

		EDD Stage	e 2B		LD	C #	360	007	(A	nch	or	En	viro	nn	nen	tal	-Se	attl	e V	VA:	/ Jo	orge	ens	en	Fo	rge	E/	AA)						i,				S.S. W. S.
LD	С	SDG#	DATE REC'D	(3) DATE DUE	PC (808	Bs 32A)	Met (602 /747	als 20A '1A)	Gra Si: (PS	ze	Spe Gra (D8	vity	TC (Plu	C mb)	To: Soli (254	ids												-										7
M	atrix:	Water/Sedimen	t		w			s								s	w	s	w	s	w	S	w	s	w	s	W	s	W	s	W	s	w	s	w	s	w s	
A		AUN8	03/09/16	03/30/16	0	16	0	15	0	15	0	15	0	15	0	15																						
																																				ightharpoonup	\bot	╝
	-				<u> </u>	<u> </u>												_4							<u> </u>										\longrightarrow			╝
	_				<u> </u>	ļ	<u> </u>																													_		╝
-	-		<u> </u>		<u> </u>																																-	╢
			ļ		<u> </u>	_				_						_									<u> </u>										\vdash			4
-	+		 				<u> </u>																									-					+	\parallel
\vdash	+				-	-																		-		-									\dashv		+	\parallel
\parallel	-	 			<u> </u>		_		-																						Ш					\dashv		╢
\parallel			 		-		├	 	_			_										 		\vdash									\dashv		\dashv		+	╢
-	+		-				-			-											-		-	_	_								-		\dashv	\dashv	+	╢
\parallel	+		 			-	┢			-						-		_				_		\vdash									\dashv	-	\dashv	╌┼	+	╢
\parallel	_				\vdash							\vdash																	-				-		\neg	\dashv	+	╢
\vdash	+	-	 				-																<u> </u>		_											\dashv	+	┨
r						\vdash					I^-		_															-	_						H	_		1
╟			1																						<u> </u>											\neg		1
																																						1
																														,								
	\perp																																				\perp	
					<u> </u>	<u> </u>			<u> </u>	<u> </u>	<u>L</u> _												<u> </u>	<u></u>											Ш			
			ļ	<u> </u>	<u> </u>	_	匚	_		_	<u>L</u> _	<u> </u>										ļ	<u> </u>		ļ										Ш			\parallel
\Vdash	\perp		ļ		ļ		$oxed{igspace}$				<u> </u>	_											<u> </u>		<u> </u>				_						$\vdash \vdash$			4
	\perp	.		 -	_	_	<u> </u>	-		-		_			<u> </u>								ـ	_	<u> </u>	<u> </u>		_	-	<u> </u>					Ш			4
\Vdash	-		<u> </u>		-		├	-		-												<u> </u>	-	-	<u> </u>	_	_		-	<u> </u>		<u> </u>			$\vdash \vdash$		\dashv	4
-	+		-		\vdash	┢	┢	\vdash				 	<u> </u>									_	-		-		_		_	<u> </u>							_	4
\Vdash	+		 		\vdash	├	├			├-	-												-	 		-		_		_		<u> </u>			├─┤	\dashv		4
F	tal	A/CR	 	 	0	16	<u> </u>	15	_	15	_	15	_	15		15	0		0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 91	╢
Пo	tal	AVCK	<u> </u>	<u> </u>	ΤÛ	110	10	15	U	15	Įυ	15	Lυ	15	U	15	U	U	U	LU	U	<u> </u>	LU	ΙU	LU	Įυ	Įυ	ΙU	LU	LU	U	U	U	U	<u> </u>		0 91	Ш

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 11, 2016

Parameters:

Metals

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUN8

Comple Identification	Laboratory Sample	Bactuire	Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-5-0-2cm-160121	AUN8A	Sediment	01/21/16
JF-LTR-5-0-10cm-160121	AUN8B	Sediment	01/21/16
JF-LTR-22-0-2cm-160121	AUN8C	Sediment	01/21/16
JF-LTR-22-0-10cm-160121	AUN8D	Sediment	01/21/16
JF-LTR-11-0-2cm-160121	AUN8E	Sediment	01/21/16
JF-LTR-11-0-10cm-160121	AUN8F	Sediment	01/21/16
JF-LTR-14-0-2cm-160121	AUN8G	Sediment	01/21/16
JF-LTR-14-0-10cm-160121	AUN8H	Sediment	01/21/16
JF-LTR-17-0-2cm-160121	AUN8I	Sediment	01/21/16
JF-LTR-17-0-10cm-160121	AUN8J	Sediment	01/21/16
JF-LTR-16-0-2cm-160121	AUN8K	Sediment	01/21/16
JF-LTR-16-0-10cm-160121	AUN8L	Sediment	01/21/16
JF-LTR-116-0-10cm-160121	AUN8M	Sediment	01/21/16
JF-LTR-15-0-2cm-160121	AUN8N	Sediment	01/21/16
JF-LTR-15-0-10cm-160121	AUN8O	Sediment	01/21/16
JF-LTR-5-0-2cm-160121MS	AUN8AMS	Sediment	01/21/16
JF-LTR-5-0-2cm-160121DUP	AUN8ADUP	Sediment	01/21/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Cadmium, Chromium, Copper, Lead, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A Mercury by EPA SW 846 Method 7471A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples		
PB (prep blank)	Lead	0.0050 mg/Kg	All samples in SDG AUN8		

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JF-LTR-5-0-2cm-160121MS (All samples in SDG AUN8)	Silver	22.0 (75-125)	J (all detects)	А

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples JF-LTR-16-0-10cm-160121 and JF-LTR-116-0-10cm-160121 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentrat	Concentration (mg/Kg)							
Analyte	JF-LTR-16-0-10cm-160121	JF-LTR-116-0-10cm-160121	RPD						
Arsenic	26.3	18.7	34						
Cadmium	0.9	0.3	100						
Chromium	27.1	23.1	16						
Copper	37.2	34.3	8						
Lead	45.8	15.6	98						
Mercury	0.08	0.09	12						
Silver	0.4	0.218	59						
Zinc	99	87	13						

XII. Internal Standards (ICP-MS)

Internal standards data were not reviewed for Stage 2B validation.

XIII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS %R, data were qualified as estimated in fifteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Metals - Data Qualification Summary - SDG AUN8

Sample	Analyte	Flag	A or P	Reason
JF-LTR-5-0-2cm-160121 JF-LTR-5-0-10cm-160121 JF-LTR-22-0-2cm-160121 JF-LTR-22-0-10cm-160121 JF-LTR-11-0-2cm-160121 JF-LTR-11-0-10cm-160121 JF-LTR-14-0-2cm-160121 JF-LTR-17-0-2cm-160121 JF-LTR-17-0-10cm-160121 JF-LTR-16-0-2cm-160121 JF-LTR-16-0-10cm-160121 JF-LTR-16-0-10cm-160121 JF-LTR-16-0-10cm-160121 JF-LTR-16-0-10cm-160121 JF-LTR-116-0-10cm-160121 JF-LTR-15-0-2cm-160121	Silver	J (all detects)	A	Matrix spike (%R)

Jorgensen Forge Early Action Area Metals - Laboratory Blank Data Qualification Summary - SDG AUN8

No Sample Data Qualified in this SDG

LDC #:_	36007A4a

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

SDG #: AUN8 Laboratory: Analytical Resources, Inc.

Reviewer: 2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020A/7471A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
ı.	Sample receipt/Technical holding times	Α	
II.	ICP/MS Tune	A	
III.	Instrument Calibration	Α	
iV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	7	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	MS
VIII.	Duplicate sample analysis	A	900
IX.	Serial Dilution	7	not performed
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	D= 12+13
XII.	Internal Standard (ICP-MS)	2	not reviewed for Stage 2B
XIII.	Sample Result Verification	N	V
ΧIV	Overall Assessment of Data	Α	

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

Client ID Lab ID Matrix Date JF-LTR-5-0-2cm-160121 AUN8A Sediment 01/21/16 AUN8B 2 JF-LTR-5-0-10cm-160121 Sediment 01/21/16 3 JF-LTR-22-0-2cm-160121 AUN8C Sediment 01/21/16 AUN8D Sediment 01/21/16 4 JF-LTR-22-0-10cm-160121 AUN8E 5 Sediment 01/21/16 JF-LTR-11-0-2cm-160121 6 JF-LTR-11-0-10cm-160121 AUN8F Sediment 01/21/16 JF-LTR-14-0-2cm-160121 AUN8G Sediment 01/21/16 AUN8H Sediment 01/21/16 8 JF-LTR-14-0-10cm-160121 9 JF-LTR-17-0-2cm-160121 AUN8I Sediment 01/21/16 10 JF-LTR-17-0-10cm-160121 AUN8J Sediment 01/21/16 11 JF-LTR-16-0-2cm-160121 AUN8K Sediment 01/21/16 12 01/21/16 JF-LTR-16-0-10cm-160121 AUN8L Sediment 13 AUN8M Sediment 01/21/16 JF-LTR-116-0-10cm-160121 14 JF-LTR-15-0-2cm-160121 AUN8N Sediment 01/21/16 JF-LTR-15-0-10cm-160121 **AUN8O** Sediment 01/21/16

LDC #: 36007A4a	
-----------------	--

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

SDG #: AUN8 Laboratory: Analytical Resources, Inc.

Date: 3-11-16 Page: 7 of 2
Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020A/7471A)

	Client ID	Lab ID	Matrix	Date
16	JF-LTR-5-0-2cm-160121MS	AUN8AMS	Sediment	01/21/16
17	JF-LTR-5-0-2cm-160121MSD DUP	AUNBAMSD DUP	Sediment	01/21/16
18				
19				
20				
21	PBS			

LDC#: 36007A4a

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	Lof_L	
Reviewer:		
2nd reviewer:_		

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1->15	sed.	Al, Sb(As)Ba, Be(Cd)Ca(Cr)Co,(Cu)Fe(Pb)Mg, Mn(Hg)Ni, K, Se(Ag)Na, Tl, V(Zn)Mo, B, Si, CN ⁻ ,
QC16,17	1	Al, Sb (As) Ba, Be, (Cd) Ca (Cr) Co (Cu) Fe, (Pb) Mg, Mn, (Hg, Ni, K, Se, (Ag) Na, Tl, V (Zn) Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
<u> </u>	<u> </u>	Analysis Method
ICP	a	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
ICP-MS	Sed	Al, Sb(As) Ba, Be, Cd Ca, Cr) Co, Cu Fe(Pb)Mg, Mn, Hg, Ni, K, Se(Ag) Na, Tl, V(Zn)Mo, B, Si, CN ⁻ ,
GEAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN

Comments: Mercury by CVAA if performed

LDC #: 36007A4a SDG #: See Cover

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Page: of Reviewer: MG
2nd Reviewer:

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: mg/kg Soil preparation factor applied: 25x
Associated Samples: all (>5x)

								у 12 — 12 — 12 — 12 — 12 — 12 — 12 — 12	11.71	
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)		No Qual's.					
Pb	0.0050			0.0250						

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC# 36007A4a

VALIDATION FINDINGS WORKSHEET Matrix Spike Analysis

Page:_	l_ofl_
Reviewer:	MG
2nd Reviewer:	9

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below	for all questions answered "N".	Not applicable questions	are identified as "N/A".
7		approam a danager.	

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor Y(N) N/A

of 4 or more, no action was taken.

(Y)N N/A Was a post digestion spike analyzed for ICP elements that did not meet the required criteria for matrix spike recovery?

LEVEL IV ONLY:

1	Date	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
		16	Sed	Ag	22.0	all 16	* J/UJ/A (all dets)
L				0			
1							
H					 		
-							
L							
L			1	<u> </u>			
ŀ			-				
1							
l							
İ							
ļ							
l		<u> </u>					
ł							
ł			1				
İ							
1							
4			_				
1		<u> </u>	_1	<u> </u>			
,	nmente:	* post digesti	ion spike	in limit .	for Aa (1	04.2%) So no	"R" qual. for NDs

MS.4SW

LDC#: 36007A4a__

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

METHOD: Metals (EPA Method 6020A/7471A)

	Concentrat	222		
Analyte	12	13	RPD	
Arsenic	26.3	18.7	34	
Cadmium	0.9	0.3	100	
Chromium	27.1	23.1	16	
Copper	37.2	34.3	8	
Lead	45.8	15.6	98	
Mercury	0,08	0.09	12	
Silver	0.4	0.218	59	
Zinc	99	87	13	

V:\FIELD DUPLICATES\FD_inorganic\36007A4a.WPD

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 11, 2016

Parameters:

Polychlorinated Biphenyls

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AUN8

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-5-0-2cm-160121	AUN8A	Sediment	01/21/16
JF-LTR-5-0-10cm-160121	AUN8B	Sediment	01/21/16
JF-LTR-22-0-2cm-160121	AUN8C	Sediment	01/21/16
JF-LTR-22-0-10cm-160121	AUN8D	Sediment	01/21/16
JF-LTR-11-0-2cm-160121	AUN8E	Sediment	01/21/16
JF-LTR-11-0-10cm-160121	AUN8F	Sediment	01/21/16
JF-LTR-14-0-2cm-160121	AUN8G	Sediment	01/21/16
JF-LTR-14-0-10cm-160121	AUN8H	Sediment	01/21/16
JF-LTR-17-0-2cm-160121	AUN8I	Sediment	01/21/16
JF-LTR-17-0-10cm-160121	AUN8J	Sediment	01/21/16
JF-LTR-16-0-2cm-160121	AUN8K	Sediment	01/21/16
JF-LTR-16-0-10cm-160121	AUN8L	Sediment	01/21/16
JF-LTR-116-0-10cm-160121	AUN8M	Sediment	01/21/16
JF-LTR-116-0-10cm-160121DL	AUN8MDL	Sediment	01/21/16
JF-LTR-15-0-2cm-160121	AUN8N	Sediment	01/21/16
JF-LTR-15-0-10cm-160121	AUN8O	Sediment	01/21/16
JF-LTR-11-0-10cm-160121MS	AUN8FMS	Sediment	01/21/16
JF-LTR-11-0-10cm-160121MSD	AUN8FMSD	Sediment	01/21/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and modified outlines of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008) and USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (October 1999). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The Aroclor-1260 result in the SRM was within the QC limits, however, the laboratory also reported Aroclor-1254 and Aroclor-1248.

IX. Field Duplicates

Samples JF-LTR-16-0-10cm-160121 and JF-LTR-116-0-10cm-160121 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concent		
Compound	JF-LTR-16-0-10cm-160121	JF-LTR-116-0-10cm-160121	RPD
Aroclor-1248	31	59U	200

	Concent		
Compound	JF-LTR-16-0-10cm-160121	JF-LTR-116-0-10cm-160121DL	RPD
Aroclor-1254	74	400	138
Aroclor-1260	73	270	115

X. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
JF-LTR-116-0-10cm-160121	Aroclor-1254 Aroclor-1260	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	А

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
JF-LTR-116-0-10cm-160121	Aroclor-1254 Aroclor-1260	R R	Α
JF-LTR-116-0-10cm-160121DL	All TCL compounds except Aroclor-1254 Aroclor-1260	R	· A

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Data Qualification Summary - SDG AUN8

Sample	Compound	Flag	A or P	Reason
JF-LTR-116-0-10cm-160121	Aroclor-1254 Aroclor-1260	R R	А	Overall assessment of data
JF-LTR-116-0-10cm-160121DL	All TCL compounds except Aroclor-1254 Aroclor-1260	R	А	Overall assessment of data

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG AUN8

No Sample Data Qualified in this SDG

LDC #: 36007A3b **VALIDATION COMPLETENESS WORKSHEET** SDG #: AUN8

Stage 2B

2nd Reviewer

Laboratory: Analytical Resources, Inc.

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	A / A	
[]	Initial calibration/ICV	Δ/Δ	$\frac{\%}{\sqrt{20}}$ $\frac{100}{\sqrt{20}} \leq 20$
111.	Continuing calibration	Δ	car = 20
IV.	Laboratory Blanks	Δ	
V.	Field blanks	N	
VI.	Surrogate spikes / 19	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples /5RM	A/su	ICS, SRM
IX.	Field duplicates	కట	D-12, 13 12, 14
X.	Compound quantitation/RL/LOQ/LODs	5W	
XI.	Target compound identification	N	
XII	Overall assessment of data	5~	

Note: A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank

OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-5-0-2cm-160121	AUN8A	Sediment	01/21/16
2	JF-LTR-5-0-10cm-160121	AUN8B	Sediment	01/21/16
3	JF-LTR-22-0-2cm-160121	AUN8C	Sediment	01/21/16
4	JF-LTR-22-0-10cm-160121	AUN8D	Sediment	01/21/16
5	JF-LTR-11-0-2cm-160121	AUN8E	Sediment	01/21/16
6	JF-LTR-11-0-10cm-160121	AUN8F	Sediment	01/21/16
7	JF-LTR-14-0-2cm-160121	AUN8G	Sediment	01/21/16
8	JF-LTR-14-0-10cm-160121	AUN8H	Sediment	01/21/16
9	JF-LTR-17-0-2cm-160121	AUN8I	Sediment	01/21/16
10	JF-LTR-17-0-10cm-160121	AUN8J	Sediment	01/21/16
11	JF-LTR-16-0-2cm-160121	AUN8K	Sediment	01/21/16
12	JF-LTR-16-0-10cm-160121 , n,	AUN8L	Sediment	01/21/16
13	JF-LTR-116-0-10cm-160121	AUN8M	Sediment	01/21/16
14	JF-LTR-116-0-10cm-160121DL	AUN8MDL	Sediment	01/21/16
15	JF-LTR-15-0-2cm-160121	AUN8N	Sediment	01/21/16
16	JF-LTR-15-0-10cm-160121	AUN8O	Sediment	01/21/16
17	JF-LTR-11-0-10cm-160121MS	AUN8FMS	Sediment	01/21/16

Labo	#:AUN8 pratory:Analytical Resource THOD: GC Polychlorinated B		Stage 2B Method 8082A)	R 2nd R	Page: 26f 2 deviewer: 71 deviewer: 7
	Client ID			Lab ID	Matrix	Date
18	JF-LTR-11-0-10cm-160121MSD			AUN8FMSD	Sediment	01/21/16
19						
20		yamin				
21						
22						
Note		<u>.</u>				
	MB - 012516					

VALIDATION COMPLETENESS WORKSHEET

LDC #: 36007A3b

LDC #:_	3600	7A3	6

VALIDATION FINDINGS WORKSHEET <u>SRM</u>

Page:_	<u></u>
Reviewer:	FT
2nd Reviewer:_	01

METHOD: ___GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y/N N/A Was SRM analyzed for each matrix in this SDG? Y/ N N/A

Was the SRM recoveries within the limits?

#	SRM	Compound			Associated Samples	Qualifications
			The Aroclor-1260 result in the standard re	eference material (SRM) was within		Text
\vdash			the QC limits. However, the laboratory Aroclor- 1248.	also reported Aroctor-1254 and		
		<u> </u>				
		· · · · · · · · · · · · · · · · · · ·				
						-
			<u> </u>		<u> </u>	<u> </u>

LDC#: 36007A3b

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page:_	/ _{of_}	_/
Reviewer		12
2nd Reviewer:_		Z

METHOD: GC PCB (EPA SW 846 Method 8082A)

	Concentra	ation (ug/Kg)	DDD
Compound	12	13	RPD
z	31	59U	200
AA	74	330	
M 33	73	240	107 - Q

*

	Concentration (ug/Kg)		DDD
Compound	12	4	RPD
Z	31	59U	200
AA	74	400	138
A B	73	270	115

47

V:\FIELD DUPLICATES\36007A3b.wpd

LDC#: 36007A3b

VALIDATION FINDINGS WORKSHEET <u>Compound Quantitation and Reported CRQLs</u>

Page:	1 _{of} _/
Reviewer:	FT
2nd Reviewer:	_0

METHOD: ___GC __ HPLO

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Findings	Associated Samples	Qualifications
	AA, BB	x1d cal Range	13	Jat /A
		-		
<u></u>				

Comments: _	See sample calculation verification	worksheet for recalculations	 	

VALIDATION FINDINGS WORKSHEET Overall Assessment of Data

Page: _.	/
Reviewer: _	FT
2nd Reviewer:	07

LDC #: 36007A3b

METHOD: \(\sqrt{GC} = HPLC \)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Associated samples	Compounds	Findings	Qualifications	
	13	AA, BB	X'd cal Range	* /\	
				1	
	a de la companya de l				
	14	all except AA, BB	dilutul	P/A	
		· ·			

Comments:		 		 	 		
	 	 	···	 	 		

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 21, 2016

Parameters:

Wet Chemistry

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc./

Materials Testing & Consulting, Inc.

Sample Delivery Group (SDG): AUN8

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-LTR-5-0-2cm-160121	AUN8A	Sediment	01/21/16
JF-LTR-5-0-10cm-160121	AUN8B	Sediment	01/21/16
JF-LTR-22-0-2cm-160121	AUN8C	Sediment	01/21/16
JF-LTR-22-0-10cm-160121	AUN8D	Sediment	01/21/16
JF-LTR-11-0-2cm-160121	AUN8E	Sediment	01/21/16
JF-LTR-11-0-10cm-160121	AUN8F	Sediment	01/21/16
JF-LTR-14-0-2cm-160121	AUN8G	Sediment	01/21/16
JF-LTR-14-0-10cm-160121	AUN8H	Sediment	01/21/16
JF-LTR-17-0-2cm-160121	AUN8I	Sediment	01/21/16
JF-LTR-17-0-10cm-160121	AUN8J	Sediment	01/21/16
JF-LTR-16-0-2cm-160121	AUN8K	Sediment	01/21/16
JF-LTR-16-0-10cm-160121	AUN8L	Sediment	01/21/16
JF-LTR-116-0-10cm-160121	AUN8M	Sediment	01/21/16
JF-LTR-15-0-2cm-160121	AUN8N	Sediment	01/21/16
JF-LTR-15-0-10cm-160121	AUN8O	Sediment	01/21/16
JF-LTR-5-0-2cm-160121MS	AUN8AMS	Sediment	01/21/16
JF-LTR-5-0-2cm-160121DUP	AUN8ADUP	Sediment	01/21/16
JF-LTR-5-0-2cm-160121TRP	AUN8ATRP	Sediment	01/21/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Grain Size by Puget Sound Estuary Protocols (PSEP) Method Specific Gravity by American Society for Testing and Materials (ASTM) D854 Total Organic Carbon by Plumb Method Total Solids by Standard Method 2540G Moisture Content by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VII. Triplicate Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The results were within QC limits.

IX. Field Duplicates

Samples JF-LTR-16-0-10cm-160121 and JF-LTR-116-0-10cm-160121 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Conc		
Analyte	JF-LTR-16-0-10cm-160121	JF-LTR-116-0-10cm-160121	RPD
Specific gravity	2.65	2.64	0
Total organic carbon	3.40 %	2.44 %	33
Total solids	42.41 %	41.99 %	1

	Percent Finer Than t		
Sieve Size (microns)	JF-LTR-16-0-10cm-160121	JF-LTR-116-0-10cm-160121	RPD
#4 (4750)	99.7	99.7	0
#10 (2000)	97.4	97.0	0
#18 (1000)	94.5	94.0	1
#35 (500)	92.0	91.8	0
#60 (250)	88.6	88.6	0
#120 (125)	78.1	78.1	0
#230 (63)	55.5	54.3	2
(31.0)	42.3	42.3	0
(15.6)	27.0	28.7	6
(7.8)	16.4	17.6	7
(3.9)	9.9	11.1	11
(2.0)	6.8	7.8	14
(1.0)	5.2	5.6	7

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Wet Chemistry - Data Qualification Summary - SDG AUN8

No Sample Data Qualified in this SDG

Jorgensen Forge Early Action Area Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG AUN8

No Sample Data Qualified in this SDG

LDC #: 36007A6 **VALIDATION COMPLETENESS WORKSHEET**

SDG #: AUN8

Level III

Laboratory: Analytical Resources, Inc./Materials Testing & Consulting, Inc.

Date: 3-11-16 Page: Reviewer: 2nd Reviewer:

METHOD: (Analyte) Grain Size (PSEP Method), Specific Gravity (ASTM D854), TOC (Plumb), Total Solids (SM 2540G)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l	Sample receipt/Technical holding times	A	
11_	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	1	
VI.	Matrix Spike/Matrix Spike Duplicates	A	Ms
VII.	Duplicate sample analysis	A	TRIP
VIII.	Laboratory control samples	A	LCS /5RM
IX.	Field duplicates	SW	D=12+13
Х.	Sample result verification	N	
xı	Overall assessment of data	L A	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate TB = Trip blank
EB = Equipment blank SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-5-0-2cm-160121	ABAUA	Sediment	01/21/16
2	JF-LTR-5-0-10cm-160121	AUN8B	Sediment	01/21/16
3	JF-LTR-22-0-2cm-160121	AUN8C	Sediment	01/21/16
4	JF-LTR-22-0-10cm-160121	AUN8D	Sediment	01/21/16
5	JF-LTR-11-0-2cm-160121	AUN8E	Sediment	01/21/16
6	JF-LTR-11-0-10cm-160121	AUN8F	Sediment	01/21/16
7	JF-LTR-14-0-2cm-160121	AUN8G	Sediment	01/21/16
8	JF-LTR-14-0-10cm-160121	AUN8H	Sediment	01/21/16
9	JF-LTR-17-0-2cm-160121	AUN8I	Sediment	01/21/16
10	JF-LTR-17-0-10cm-160121	AUN8J	Sediment	01/21/16
11	JF-LTR-16-0-2cm-160121	AUN8K	Sediment	01/21/16
12	JF-LTR-16-0-10cm-160121	AUN8L	Sediment	01/21/16
13	JF-LTR-116-0-10cm-160121	AUN8M	Sediment	01/21/16
14	JF-LTR-15-0-2cm-160121	AUN8N	Sediment	01/21/16
15	JF-LTR-15-0-10cm-160121	AUN8O	Sediment	01/21/16
16	JF-LTR-5-0-2cm-160121MS	AUN8AMS	Sediment	01/21/16
47	UF LTD-5-0-2em-460424M6D	ALINGAMOD	Sodimont	01/21/16

SDC	LDC #: 36007A6 VALIDATION COMPLETENESS WORKSHEET SDG #: AUN8 Level III Page: 2-of 2 Laboratory: Analytical Resources, Inc./Materials Testing & Consulting, Inc. Reviewer: MG 2nd Reviewer: OC METHOD: (Analyte) Grain Size (PSEP Method), Specific Gravity (ASTM D854), TOC (Plumb), Total Solids (SM 2540G)					
	Client ID	Lab ID	Matrix	Date		
18	JF-LTR-5-0-2cm-160121DUP	AUN8ADUP	Sediment	01/21/16		
19	JF-LTR-5-0-2cm-160121TRP	AUN8ATRP	Sediment	01/21/16		
20						
21						
22						
23						
24						
25	PBS					

LDC #: 36 00 7A6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: __lof_l Reviewer: _____ 2nd reviewer: _____

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1 → 15	Sed	pH TDS CI F NO, NO, SO, PO, ALK CN- NH, TKN TOC CR6+ CIO, TS Grain Size SG
OC 16	Î	pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN- NH ₃ TKN (TOC) CR ⁶⁺ CIO ₄
₹ 18,19		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOO CR8+ CIO4 TS Grain SG
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+ CIO,
		PH TDS CLE NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN. NH3 TKN TOC CR8+ CIO4
		ph tds ci f no, no, so, po, alk cn nh, tkn toc cr6+ cio,
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO, SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR8+ CIO4
		PH TDS CI F NO3 NO, SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
	<u> </u>	pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ ClO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ ClO ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁵ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+ ClO,
		pH TDS CLE NO. NO. SO. PO. ALK CN. NH. TKN TOC CR6+ CIO.
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄ pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph TDS CLF NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ClO ₄ ph TDS CLF NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ClO ₄

Comments:		
	 	

LDC#: 36007A6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_	1 of 2
Reviewer:	MG
2nd Reviewer:	

Inorganics, Method See Cover

	Concentra			
Analyte	12	13	RPD	
Specific Gravity (no units)	2.65	2.64	0	
Total Organic Carbon	3.40	2.44	33	
Total Solids	42.41	41.99	1	

V:\FIELD DUPLICATES\FD_inorganic\36007A6a.WPD

LDC#_36007A6____

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: 2 of 2
Reviewer: MG
2nd Reviewer:

Inorganics: Method See Cover

	Percent Finer Than			
Sieve Size (microns)	12	13	RPD	
3/8"	100.0	100.0	0	
#4 (4750)	99.7	99.7	0	
#10 (2000)	97.4	97.0	0	
#18 (1000)	94.5	94.0	1	
#35 (500)	92.0	91.8	0	
#60 (250)	88.6	88.6	0	
#120 (125)	78.1	78.1	0	
#230 (63)	55.5	54.3	2	
31.0	42.3	42.3	0	
(15.6)	27.0	28.7	6	
7.8	16.4	17.6	7	
(3.9)	9.9	11.1	11	
2.0	6.8	7.8	14	
1.0	5.2	5.6	7	

V:\FIELD DUPLICATES\FD_inorganic\36007A6b.wpd

LDC #: 36007

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

The LDC job number listed above was entered by _____

completeness methods present? methods present/match report? methods present? methods present/match report? atch - / / /			
exported analytes present? exported analytes present? exertification of EDD? Preparation/Entry evel applied? Stage28 or EPAStage4) eratory EMPC qualified results qualified	/		
Preparation/Entry Level applied? Stage21 or EPAStage4) Preparatory EMPC qualified results qualified			
Preparation/Entry Level applied? Stage29 or EPAStage4) Practory EMPC qualified results qualified	-	(In)	
Preparation/Entry Level applied? Stage20 or EPAStage4) oratory EMPC qualified results qualified	-		
Level applied? Stage2B or EPAStage4) oratory EMPC qualified results qualified	-		
Level applied? Stage2B or EPAStage4) oratory EMPC qualified results qualified	- √		
Stage28 or EPAStage4) ratory EMPC qualified results qualified	/		
		(3)	
	~	(2)	
	4.		
nableness Checks	-		
ll qualified ND results have ND qualifier J)?	μ (
ll qualified detect results have detect er (i.e. J)?	/	Q	
son codes used, do all qualified results eason code field populated, and vice	/	(F)	
ank concentrations in report match EDD, data was qualified due to blank?	Μ	A	
e any results reported above calibration If so, were results qualified priately?	×	B	
Ill results marked reportable "Yes" unless d for overall assessment in the data ion report?	/		
ere any lab "R" qualified data? / Are the	M	W	
olumns blank for these results?	M	(B)	
	If so, were results qualified riately? If results marked reportable "Yes" unless d for overall assessment in the data on report? Pere any lab "R" qualified data? / Are the plumns blank for these results? detect flag set to "N" for all "U" qualified	If so, were results qualified riately? If results marked reportable "Yes" unless d for overall assessment in the data on report? Pere any lab "R" qualified data? / Are the plumns blank for these results?	If so, were results qualified riately? If results marked reportable "Yes" unless of for overall assessment in the data on report? There any lab "R" qualified data? / Are the columns blank for these results? If the solution of the solut

IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?	M	W
Notes <u>:</u>	*see readme		

The attached zipped file contains two files:

1) Readme_Jorgensen_031716.doc

<u>File</u>

Format

MS Word 2003

Description

A "Readme" file (this document).

MS Excel 2007

A spreadsheet for the following SDG(s):

2) LDC36007_AUN8_VEDD_20160316.xlsx

AUN8

36007A

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 17, 2016

SUBJECT: Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed is the final validation report for the fraction listed below. This SDG was received on March 9, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #36008:

SDG#

Fraction

AWE4

Polychlorinated Biphenyls

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area, September 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Method Data Review, October 1999
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist

	EDD Stage	e 2B		LD	C#	‡36(800	(A	nch	or	En	viro	onn	nen	tal	-Se	attl	e V	VA.	/ Jo	rge	ens	en	Fo	rge	E	AA)							-			1000
LDC	SDG#	DATE REC'D	(3) DATE DUE	PC (808																																	
Matr	ix: Water/Sedimer	T		w		w	s	w	s	w	s	W	s	w	s	w	s	W	s	w	s	w	s	W_	s	w	s	w	s	w	s	w	s	w	s	w s	<u>:</u>
<u>A</u>	AWE4	03/09/16	03/30/16	1	0																														}		╝
		ļ				ऻ				_																											4
-		<u> </u>		-		_				-												\vdash							_							-+-	$-\parallel$
-		<u> </u>			-	_				_		-													_				<u> </u>		_					+	\dashv
1		<u> </u>		-	 	┢╌				-	 	-																							\rightarrow	\rightarrow	╣
	 	+	 		 	\vdash		\vdash		\vdash			<u> </u>									\vdash			\vdash			_							\dashv	+	\dashv
		 	 	 	1			-		\vdash																		_		-					\dashv	-	\exists
		†			\vdash	 											_																		\dashv	\top	\exists
		***																												 					\Box		٦
																																					٦
						<u>L</u>																					<u> </u>										╛
<u> </u>				<u> </u>	<u> </u>	<u> </u>				_		<u> </u>	<u> </u>														<u> </u>									\rightarrow	4
		 		<u> </u>		<u> </u>			<u> </u>																			-		ļ						+	4
<u> </u>				╂		├-			ļ																	_		-		<u> </u>						+	4
\blacksquare		 	ļ <u>.</u>	1		ļ				<u> </u>																<u> </u>	-	-	 								┨
-		-		-		-																														-+	\dashv
\vdash		 		\vdash	-	┢	-	-	 																											+	\dashv
		†				\vdash				-		<u> </u>													-												┨
		1				†																														\top	٦
																																					٦
																																			$oxedsymbol{oxed}$	$\perp \!\!\! \perp$	\rfloor
									ļ						<u> </u>				<u> </u>							<u> </u>								Ш		\dashv	_
		1	<u> </u>	 	<u> </u>	<u> </u>	_		<u> </u>		_		_	_	<u> </u>					<u> </u>			_	<u> </u>	 			<u> </u>		 	_					+	4
<u> </u>		ļ	<u> </u>	-	-						<u> </u>	<u> </u>					<u> </u>				_	_	<u> </u>	ļ	_		_		\vdash	<u> </u>	_						4
\vdash		<u> </u>		+-	┼	\vdash		-	 			\vdash						 			_	├		_		_		-	\vdash							+	┨
Tota	A/CR	1	<u> </u>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 1	\forall
Tota	A/CK	<u></u>		<u> </u>	Ī	<u> </u>	10	ΙÜ	ΙU		ı U	ΙŪ	I U	<u> </u>	U	LU		<u> </u>	LU		LU	10	U	<u> </u>	10	<u> </u>	U	<u> </u>	l O	Τú		U	U	L U		<u> </u>	Ц

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 11, 2016

Parameters:

Polychlorinated Biphenyls

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AWE4

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-Rinsate-V-160201	AWE4A	Water	02/01/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and modified outlines of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008) and USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (October 1999). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample JF-Rinsate-V-160201 was identified as a rinsate. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Data Qualification Summary - SDG AWE4

No Sample Data Qualified in this SDG

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG AWE4

No Sample Data Qualified in this SDG

SDG # Labora METH	t: <u>AWE4</u> atory: <u>Analytical Resources, Inc.</u> OD: GC Polychlorinated Biphenyls (EP	S A SW846 M	tage 2B ethod 8082A	•		Date: 3 /11 /16 Page: _/of _/ Reviewer:
	amples listed below were reviewed for eartiential indings worksheets.	acri oi trie ic	Jilowing valid	ation areas. Vai	idation indings are	noted in attached
	Validation Area			C	omments	
1.	Sample receipt/Technical holding times	AIA				
11.	Initial calibration/ICV	ALA	o/o e	SD/101 col =	£ 20	
111.	Continuing calibration	A		col =	= 20	
IV.	Laboratory Blanks	4				
V.	Field blanks	NO	R= 1			
Vi.	Surrogate spikes //>	A				
VII.	Matrix spike/Matrix spike duplicates	1	QC So	ample		
VIII.	Laboratory control samples	A	vc>			
IX.	Field duplicates	N	·····			
X.	Compound quantitation/RL/LOQ/LODs	N				
XI.	Target compound identification	N	, ,,, , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
LXIL	Overall assessment of data	A				
Note:	N = Not provided/applicable R = Ri	No compounds nsate Field blank	detected	D = Duplicate TB = Trip blank EB = Equipmen	OTHER:	rce blank
	Client ID			Lab ID	Matrix	Date
1 J	F-Rinsate-V-160201			AWE4A	Water	02/01/16
2						
3						
4						
5						
6						
7						
8						
9						
10			1			
Notes:						
M	13-021916					
						

LDC #: 3600 8

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

Date:	3	•	/	7	•	!	ŧ
-			_		_		

The LDC job number listed above was entered by

Page: 1_of 1 2nd Reviewer:

	EDD Process	Y/N	Init	Comments/Action
ı.	EDD Completeness	-		
la.	- All methods present?	1	0	
lb.	- All samples present/match report?	1	Q	
lc.	- All reported analytes present?	1		
ld	-10% verification of EDD?	/	W	
1	The state of the s			
<u>II.</u>	EDD Preparation/Entry		w	
lla.	- QC Level applied? (EPAStage 2 B or EPAStage4)	V	W	
llb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	Λ.	(M)	
	TATURES AND SHOULD SHOW			
III.	Reasonableness Checks	-		
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	W	Q	
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	N	D	
IIIc.	- If reason codes used, do all qualified results have reason code field populated, and vice versa?	N		
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	~	(3)	
IIIe.	- Were any results reported above calibration range? If so, were results qualified appropriately?	N	()	
IIIf.	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	/	(
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	N	(2)	
IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?	N	(J.)	

10162.	see readme	 		 	
		 	 	 	
				 	·
	*		 		
			1	 	

The attached zipped file contains two files:

File Format Description
1) Readme_Jorgensen_031716.doc MS Word 2003 Description
A "Readme" file (this document).

MS Excel 2007 A spreadsheet for the following SDG(s):

2) LDC36008_AWE4_VEDD_20160316.xlsx AWE4 36008A

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.

2701 Loker Ave. West, Suite 220, Car

March 24, 2016

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields

SUBJECT: Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed is the final validation report for the fractions listed below. This SDG was received on March 24, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #36090:

SDG # Fraction

AVM7 Polychlorinated Biphenyls, Metals, Wet Chemistry

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area, September 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Method Data Review, October 1999
- Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area, September 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007



Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist

Attachment 1 507 Pages-SF ASAP - no charge LDC #36090 (Anchor Environmental-Seattle WA / Jorgensen Forge EAA) Stage 2B EDD Specific Metals Grain Total (3) DATE DATE **PCBs** (6020A TOC Solids Gravity Size REC'D DUE (8082A) | /7471A) | (PSEP) | (Plumb) | (2540G) (D854) LDC SDG# w s w s w s w s w s w s w s w s w s w s w s w Matrix: Water/Sediment 0 14 14 0 14 0 14 0 14 0 14 0 03/24/16 ASAP AVM7 0 0 0 0 0 A/CR Total

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 24, 2016

Parameters:

Polychlorinated Biphenyls

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AVM7

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
JF-LTR-15-0-60cm-160127	AVM7A	Sediment	01/27/16
JF-LTR-17-0-60cm-160127	AVM7B	Sediment	01/27/16
JF-LTR-22-0-60cm-160128	AVM7C	Sediment	01/28/16
JF-LTR-9-0-32cm-160128	AVM7D	Sediment	01/28/16
JF-LTR-9-32-60cm-160128	AVM7E	Sediment	01/28/16
JF-LTR-11-0-60cm-160129	AVM7F	Sediment	01/29/16
JF-LTR-111-0-60cm-160129	AVM7G	Sediment	01/29/16
JF-LTR-12-0-60cm-160129	AVM7H	Sediment	01/29/16
JF-LTR-3-0-60cm-160129	AVM7I	Sediment	01/29/16
JF-LTR-8-0-60cm-160129	AVM7J	Sediment	01/29/16
JF-LTR-14-0-60cm-160201	AVM7K	Sediment	02/01/16
JF-LTR-21-0-60cm-160201	AVM7L	Sediment	02/01/16
JF-LTR-4-0-50cm-160201	AVM7M	Sediment	02/01/16
JF-LTR-10-0-60cm-160128	AVM7AC	Sediment	01/28/16
JF-LTR-12-0-60cm-160129MS	AVM7HMS	Sediment	01/29/16
JF-LTR-12-0-60cm-160129MSD	AVM7HMSD	Sediment	01/29/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and modified outlines of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008) and USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (October 1999). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the method. The Aroclor-1260 result in the SRM was within the QC limits, however, the laboratory also reported Aroclor-1254.

IX. Field Duplicates

Samples JF-LTR-11-0-60cm-160129 and JF-LTR-111-0-60cm-160129 were identified as field duplicates. No results were detected in any of the samples.

X. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Data Qualification Summary - SDG AVM7

No Sample Data Qualified in this SDG

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG AVM7

No Sample Data Qualified in this SDG

LDC #: 36090A3b

SDG #: AVM7

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Laboratory: Analytical Resources, Inc.

Page: / of Reviewer: 2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	A A	
II.	Initial calibration/ICV	AA	% PSD/ICV=20 CCV = 20
111.	Continuing calibration	Δ	cu = w
IV.	Laboratory Blanks	Д	
V.	Field blanks	N	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples / S R M	А	LCS, SRM
IX.	Field duplicates	ND	D = 6.7
X.	Compound quantitation/RL/LOQ/LODs	N	•
XI.	Target compound identification	N	
_XII	Overall assessment of data		

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-15-0-60cm-160127	AVM7A	Sediment	01/27/16
2	JF-LTR-17-0-60cm-160127	AVM7B	Sediment	01/27/16
3	JF-LTR-22-0-60cm-160128	AVM7C	Sediment	01/28/16
4	JF-LTR-9-0-32cm-160128	AVM7D	Sediment	01/28/16
5	JF-LTR-9-32-60cm-160128	AVM7E	Sediment	01/28/16
6	JF-LTR-11-0-60cm-160129	AVM7F	Sediment	01/29/16
7	JF-LTR-111-0-60cm-160129	AVM7G	Sediment	01/29/16
8	JF-LTR-12-0-60cm-160129	AVM7H	Sediment	01/29/16
9	JF-LTR-3-0-60cm-160129	AVM7!	Sediment	01/29/16
10	JF-LTR-8-0-60cm-160129	AVM7J	Sediment	01/29/16
11	JF-LTR-14-0-60cm-160201	AVM7K	Sediment	02/01/16
12	JF-LTR-21-0-60cm-160201	AVM7L	Sediment	02/01/16
13	JF-LTR-4-0-50cm-160201	AVM7M	Sediment	02/01/16
14	JF-LTR-10-0-60cm-160128	AVM7AC	Sediment	01/28/16
15	JF-LTR-12-0-60cm-160129MS	AVM7HMS	Sediment	01/29/16
16	JF-LTR-12-0-60cm-160129MSD	AVM7HMSD	Sediment	01/29/16
17	MB-020816			

LDC #:_	36090A3b

VALIDATION FINDINGS WORKSHEET SRM

Page:	<u>/</u> of/
Reviewer:	FT
2nd Reviewer:	CZ

METHOD: GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N/A Was SRM analyzed for each matrix in this SDG?

Y/N N/A Was the SRM recoveries within the limits?

#_	SRM	Compound				Associated Samples	Qualifications
		_	The Aroclor-1260 result in the QC limits. However, the	the standard reference mat ne laboratory also reported	erial (SRM) was within Aroclor-1254.		Text
				т.	<u> </u>		
				_			
\parallel							
							
			~ ~ ~				

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 24, 2016

Parameters:

Metals

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AVM7

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-15-0-60cm-160127	AVM7A	Sediment	01/27/16
JF-LTR-17-0-60cm-160127	AVM7B	Sediment	01/27/16
JF-LTR-22-0-60cm-160128	AVM7C	Sediment	01/28/16
JF-LTR-9-0-32cm-160128	AVM7D	Sediment	01/28/16
JF-LTR-9-32-60cm-160128	AVM7E	Sediment	01/28/16
JF-LTR-11-0-60cm-160129	AVM7F	Sediment	01/29/16
JF-LTR-111-0-60cm-160129	AVM7G	Sediment	01/29/16
JF-LTR-12-0-60cm-160129	AVM7H	Sediment	01/29/16
JF-LTR-3-0-60cm-160129	AVM7I	Sediment	01/29/16
JF-LTR-8-0-60cm-160129	AVM7J	Sediment	01/29/16
JF-LTR-14-0-60cm-160201	AVM7K	Sediment	02/01/16
JF-LTR-21-0-60cm-160201	AVM7L	Sediment	02/01/16
JF-LTR-4-0-50cm-160201	AVM7M	Sediment	02/01/16
JF-LTR-10-0-60cm-160128	AVM7AC	Sediment	01/28/16
JF-LTR-15-0-60cm-160127MS	AVM7AMS	Sediment	01/27/16
JF-LTR-15-0-60cm-160127DUP	AVM7ADUP	Sediment	01/27/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Cadmium, Chromium, Copper, Lead, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A Mercury by EPA SW 846 Method 7471A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium Lead Mercury	0.06 mg/Kg 0.0050 mg/Kg 0.00167 mg/Kg	All samples in SDG AVM7

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JF-LTR-17-0-60cm-160127	Mercury	0.00156 mg/Kg	0.00156U mg/Kg
JF-LTR-22-0-60cm-160128	Mercury	0.00502 mg/Kg	0.00502U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
JF-LTR-11-0-60cm-160129	Mercury	0.00160 mg/Kg	0.00160U mg/Kg
JF-LTR-111-0-60cm-160129	Mercury	0.00497 mg/Kg	0.00497U mg/Kg
JF-LTR-12-0-60cm-160129	Mercury	0.00333 mg/Kg	0.00333U mg/Kg
JF-LTR-14-0-60cm-160201	Mercury	0.00512 mg/Kg	0.00512U mg/Kg
JF-LTR-4-0-50cm-160201	Mercury	0.00421 mg/Kg	0.00421U mg/Kg

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	%R (Limits)	Flag	A or P
JF-LTR-15-0-60cm-160127MS (All samples in SDG AMV7)	Chromium	248 (75-125)	J (all detects)	А

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Flag	A or P
JF-LTR-15-0-60cm-160127DUP	Chromium	87.0 (≤30)	J (all detects)	А
(All samples in SDG AMV7)	Zinc	32.0 (≤30)	J (all detects)	

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples JF-LTR-11-0-60cm-160129 and JF-LTR-111-0-60cm-160129 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentrat		
Analyte	JF-LTR-11-0-60cm-160129	JF-LTR-111-0-60cm-160129	RPD
Arsenic	0.8	0.9	12
Cadmium	0.0248	0.0303	20
Chromium	22.6	13.5	50
Copper	34.0	21.5	45
Lead	1.13	0.96	16
Mercury	0.00160	0.00497	103
Silver	0.025	0.020	22
Zinc	25	22	13

XII. Internal Standards (ICP-MS)

Internal standards data were not reviewed for Stage 2B validation.

XIII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS %R and DUP RPD, data were qualified as estimated in fourteen samples.

Due to laboratory blank contamination, data were qualified as not detected in seven samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Metals - Data Qualification Summary - SDG AVM7

Sample	Analyte	Flag	A or P	Reason
JF-LTR-15-0-60cm-160127 JF-LTR-17-0-60cm-160127 JF-LTR-22-0-60cm-160128 JF-LTR-9-0-32cm-160128 JF-LTR-9-032-60cm-160128 JF-LTR-11-0-60cm-160129 JF-LTR-111-0-60cm-160129 JF-LTR-12-0-60cm-160129 JF-LTR-3-0-60cm-160129 JF-LTR-4-0-60cm-160201 JF-LTR-14-0-60cm-160201 JF-LTR-4-0-50cm-160201 JF-LTR-4-0-50cm-160201 JF-LTR-14-0-60cm-160201	Chromium	J (all detects)	А	Matrix spike/Matrix spike duplicate (%R)
JF-LTR-15-0-60cm-160127 JF-LTR-17-0-60cm-160127 JF-LTR-22-0-60cm-160128 JF-LTR-9-0-32cm-160128 JF-LTR-9-32-60cm-160128 JF-LTR-11-0-60cm-160129 JF-LTR-111-0-60cm-160129 JF-LTR-3-0-60cm-160129 JF-LTR-3-0-60cm-160129 JF-LTR-4-0-60cm-160129 JF-LTR-14-0-60cm-160201 JF-LTR-10-60cm-160201 JF-LTR-10-0-60cm-160201	Chromium Zinc	J (all detects) J (all detects)	A	Duplicate sample analysis (RPD)

Jorgensen Forge Early Action Area Metals - Laboratory Blank Data Qualification Summary - SDG AVM7

Sample	Analyte	Modified Final Concentration	A or P
JF-LTR-17-0-60cm-160127	Mercury	0.00156U mg/Kg	Α
JF-LTR-22-0-60cm-160128	Mercury	0.00502U mg/Kg	Α
JF-LTR-11-0-60cm-160129	Mercury	0.00160U mg/Kg	А
JF-LTR-111-0-60cm-160129	Mercury	0.00497U mg/Kg	Α
JF-LTR-12-0-60cm-160129	Mercury	0.00333U mg/Kg	Α
JF-LTR-14-0-60cm-160201	Mercury	0.00512U mg/Kg	Α
JF-LTR-4-0-50cm-160201	Mercury	0.00421U mg/Kg	А

LDC #: 36090A4a

VALIDATION COMPLETENESS WORKSHEET

SDG #: AVm7 AVM7

Stage 2B

Date: 3246

Page: of 2

Reviewer: 2

2nd Reviewer: 52

Laboratory: Analytical Resources, Inc.

METHOD: Metals (EPA SW 846 Method 6020A/7471A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	AIA	
11.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	\sim	
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	SW	
IX.	Serial Dilution	N	not performed
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(6,7)
XII.	Internal Standard (ICP-MS)	N	norverience
XIII.	Sample Result Verification	N	<u>'</u>
LxIV	Overall Assessment of Data	IA	

Note: A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-15-0-60cm-160127	AVM7A	Sediment	01/27/16
2	JF-LTR-17-0-60cm-160127	AVM7B	Sediment	01/27/16
3	JF-LTR-22-0-60cm-160128	AVM7C	Sediment	01/28/16
4	JF-LTR-9-0-32cm-160128	AVM7D	Sediment	01/28/16
5	JF-LTR-9-32-60cm-160128	AVM7E	Sediment	01/28/16
3	JF-LTR-11-0-60cm-160129	AVM7F	Sediment	01/29/16
7	JF-LTR-111-0-60cm-160129	AVM7G	Sediment	01/29/16
3	JF-LTR-12-0-60cm-160129	AVM7H	Sediment	01/29/16
)	JF-LTR-3-0-60cm-160129	AVM7I	Sediment	01/29/16
0	JF-LTR-8-0-60cm-160129	AVM7J	Sediment	01/29/16
1	JF-LTR-14-0-60cm-160201	AVM7K	Sediment	02/01/16
2	JF-LTR-21-0-60cm-160201	AVM7L	Sediment	02/01/16
3	JF-LTR-4-0-50cm-160201	AVM7M	Sediment	02/01/16
4	JF-LTR-10-0-60cm-160128	AVM7AC	Sediment	01/28/16
15	JF-LTR-15-0-60cm-160127MS	AVM7AMS	Sediment	01/27/16

LDC	#:	36090A4a	_
-----	----	----------	---

VALIDATION COMPLETENESS WORKSHEET

SDG #: AVM7 AVM7

Stage 2B

Laboratory: Analytical Resources, Inc.

Page: Zof Z Reviewer: 2nd Reviewer: Sh

METHOD: Metals (EPA SW 846 Method 6020A/7471A)

	Client ID	Lab ID	Matrix	Date
16	JF-LTR-15-0-60cm-160127DUP	AVM7ADUP	Sediment	01/27/16
17				
18				
19				
20				
Note	s:			

LDC# 36090 Ma

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page: of Reviewer: CR 2nd reviewer: SD

All circled elements are applicable to each sample.

, ,		
		·
Sample ID	Matrix	Target Analyte List (TAL)
1-14		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mh, Hg, Ni, K, Se, Ag, Na, Tl, V(Zh) Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
CC15,16		Al, Sb(As) Ba, Be, Cd, Ca, Cr, Co, Cu) Fe, (b, Mg, Mn, Ag) Ni, K, Se, (Ag) Na, Tl, V(Zr), Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Ph, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti

Comments: Mercury by CVAA if performed

LDC #: 36090A4a

VALIDATION FINDINGS WORKSHEET

PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted:

Soil preparation factor applied:_

Associated Samples:

ΑII

Sample	Jonicentratic	ni unito, uni	CSS Official	rise noteu.	mg/Ng			Socialed Sail	ipics.	All	 	
				an Kilonopulan S	W _{les}			S	ample Identifi	cation		
Analyte	Maximum PB ^a (mg/Kg)	Maximum ICB/CCB ^a (ug/L)		2	3	6	7	8	11	13		
Cr	0.06	1	0.3									
Pb	0.0050		0.025				·					
Hg	0.00167		0.0084	0.00156	0.00502	0.00160	0.00497	0.00333	0.00512	0.00421		

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: 36090A4

VALIDATION FINDINGS WORKSHEET <u>Matrix Spike Analysis</u>

Page: <u></u> of	
Reviewer: OR	
2nd Reviewer:	

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qu	alifications below for all c	questions answ	vered "N". Not a	oplicable questions	s are identified as "N/A".	
DN N/A	Was a matrix spike an	alyzed for eacl	n matrix in this S	SDG?		·
Y(N) N/A	Were matrix spike per	cent recoveries	s (%R) within the	e control limits of 7	5-125?) If the sample concen	tration exceeded the spike concentration by a factor
_	of 4 or more, no action	was taken.				
Y N NA LEVEL IV ONI	Was a post digestion s	pike analyzed	for ICP element	s that did not mee	t the required criteria for matr	ix spike recovery?
LEVEL IV ONI	LY:					
Y N (N/A)	Were recalculated resu	ults acceptable	? See Level IV	Recalculation Wor	rksheet for recalculations.	
# Date	Matrix Spike ID	Matrix	Analyte	%R	Associated Samples	Qualifications
	15	3	ICC	248	All	Soft A (det)
		 	 ~ 	10.0		1 Well (III (SG))
1		-				<u> </u>
 		ļ				
<u> </u>						
	1				1	
<u> </u>		<u> </u>	- 	ļ		
<u> </u>		ļ	 	<u> </u>		
			 			
<u> </u>				 		
<u> </u>	<u> </u>	<u> </u>	4	 		
		ļ	<u> </u>			
I						
l 		 	 			
<u> </u>		<u> </u>		<u> </u>		
		<u> L</u>		<u> </u>	<u></u>	
Comments:						•

LDC #: 36090AYa

VALIDATION FINDINGS WORKSHEET Duplicate Analysis

Page: of \
Reviewer:
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

 (\mathcal{N}) N N/A

Was a duplicate sample analyzed for each matrix in this SDG?

Y/M\N/A

Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY.

<u> </u>	EL IV ONL	Were recalculated re	sults accepta	ble? See Lev	el IV Recalculation Wo	orksheet for recalcular	tions.	<u> </u>
#	Date	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
		16	5	CC	87-0 (430)		AII	JUJA (Ad)
				Zn	32,0		J	1 1
\perp								
\perp								
┼-							· · · · · · · · · · · · · · · · · · ·	
╀								
+			<u></u>		 			
$^{+}$	·		 	<u> </u>				
\dagger			 	 				
t			+					
Ť						· · · · · · · · · · · · · · · · · · ·		
\perp								
<u> </u>								
\perp								
_				ļ				
4				<u> </u>				
+	· · · · · · · · · · · · · · · · · · ·			<u> </u>				
+			-	ļ				
+							<u>.</u>	
								

Comments:

LDC#: 36090A4a

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: of Page: Of Pag

METHOD: Metals (EPA Method 6010B/7000)

	Concentrat			
Analyte	6	7	RPD	
Arsenic	0.8	0.9	12	
Cadmium	0.0248	0.0303	20	
Chromium	22.6	13.5	50	
Copper	34.0	21.5	45	
Lead	1.13	0.96	16	
Mercury	0.00160	0.00497	103	
Silver	0.025	0.020	22	
Zinc	25	22	13	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\36090A4a.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Jorgensen Forge Early Action Area

LDC Report Date: March 24, 2016

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: Analytical Resources, Inc./

Materials Testing & Consulting, Inc.

Sample Delivery Group (SDG): AVM7

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-LTR-15-0-60cm-160127	AVM7A	Sediment	01/27/16
JF-LTR-17-0-60cm-160127	AVM7B	Sediment	01/27/16
JF-LTR-22-0-60cm-160128	AVM7C	Sediment	01/28/16
JF-LTR-9-0-32cm-160128	AVM7D	Sediment	01/28/16
JF-LTR-9-32-60cm-160128	AVM7E	Sediment	01/28/16
JF-LTR-11-0-60cm-160129	AVM7F	Sediment	01/29/16
JF-LTR-111-0-60cm-160129	AVM7G	Sediment	01/29/16
JF-LTR-12-0-60cm-160129	AVM7H	Sediment	01/29/16
JF-LTR-3-0-60cm-160129	AVM7I	Sediment	01/29/16
JF-LTR-8-0-60cm-160129	AVM7J	Sediment	01/29/16
JF-LTR-14-0-60cm-160201	AVM7K	Sediment	02/01/16
JF-LTR-21-0-60cm-160201	AVM7L	Sediment	02/01/16
JF-LTR-4-0-50cm-160201	AVM7M	Sediment	02/01/16
JF-LTR-10-0-60cm-160128	AVM7AC	Sediment	01/28/16
JF-LTR-15-0-60cm-160127MS	AVM7AMS	Sediment	01/27/16
JF-LTR-15-0-60cm-160127DUP	AVM7ADUP	Sediment	01/27/16
JF-LTR-9-32-60cm-160128DUP	AVM7EDUP	Sediment	01/28/16
JF-LTR-9-32-60cm-160128TRP	AVM7ETRP	Sediment	01/28/16
JF-LTR-15-0-60cm-160127TRP	AVM7ATRP	Sediment	01/27/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Grain Size by Puget Sound Estuary Protocols (PSEP) Method
Total Organic Carbon by Plumb Method
Total Solids by Standard Method 2540G
Specific Gravity by American Society for Testing and Materials (ASTM) D854
Moisture Content by ASTM D2216

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VII. Triplicates Sample Analysis

Triplicate (TRP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples/Standard Reference Materials

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

Standard reference materials (SRM) were analyzed as required by the methods. The results were within QC limits.

IX. Field Duplicates

Samples JF-LTR-11-0-60cm-160129 and JF-LTR-111-0-60cm-160129 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Conce		
Analyte	JF-LTR-11-0-60cm-160129	RPD	
Total organic carbon	0.026 %	0.022 %	17
Total solids	96.52 %	96.74 %	0
Specific gravity	2.83	2.83	0

	Percent Finer Than t		
Sieve Size (microns)	JF-LTR-11-0-60cm-160129	JF-LTR-111-0-60cm-160129	RPD
#4 (4750)	32.1	26.9	18
#10 (2000)	1.8	1.0	57
#18 (1000)	1.2	0.3	120
#35 (500)	1.1	0.2	138
#60 (250)	1.1	0.2	138
#120 (125)	1.1	0.2	138
#230 (63)	1.0	0.2	133

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Wet Chemistry - Data Qualification Summary - SDG AVM7

No Sample Data Qualified in this SDG

Jorgensen Forge Early Action Area
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG AVM7

No Sample Data Qualified in this SDG

LDC #: <u>36090A6</u>	_ VALIDATION COMPLETENESS WORKSHEET
SDG #: <u>AVM7/15T001-120</u>	Level III

Page: ___ of ___ Reviewer: ____ 2nd Reviewer: ____

Laboratory: <u>Analytical Resources, Inc./Materials Testing & Consulting, Inc.</u>

METHOD: (Analyte) Grain Size (PSEP Method), TOC (Plumb), Total Solids (SM 2540G), Specific Gravity (ASTMD854)

べらいた。 (ASTMD854)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Sample receipt/Technical holding times	AA	
11	Initial calibration	A	
111.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	/\	
VII.	Duplicate sample analysis	A,	TRY,
VIII.	Laboratory control samples	AA	4CS /SRM
IX.	Field duplicates	5W	(6,7)
X.	Sample result verification	Ŋ	
xı	Overall assessment of data	<u> </u>	

Note: A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

SB=Source blank OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-LTR-15-0-60cm-160127	AVM7A	Sediment	01/27/16
2	JF-LTR-17-0-60cm-160127	AVM7B	Sediment	01/27/16
3	JF-LTR-22-0-60cm-160128	AVM7C	Sediment	01/28/16
4	JF-LTR-9-0-32cm-160128	AVM7D	Sediment	01/28/16
5	JF-LTR-9-32-60cm-160128	AVM7E	Sediment	01/28/16
6	JF-LTR-11-0-60cm-160129	AVM7F	Sediment	01/29/16
7	JF-LTR-111-0-60cm-160129	AVM7G	Sediment	01/29/16
8	JF-LTR-12-0-60cm-160129	AVM7H	Sediment	01/29/16
9	JF-LTR-3-0-60cm-160129	AVM7I	Sediment	01/29/16
10	JF-LTR-8-0-60cm-160129	AVM7J	Sediment	01/29/16
11	JF-LTR-14-0-60cm-160201	AVM7K	Sediment	02/01/16
12	JF-LTR-21-0-60cm-160201	AVM7L	Sediment	02/01/16
13	JF-LTR-4-0-50cm-160201	AVM7M	Sediment	02/01/16
14	JF-LTR-10-0-60cm-160128	AVM7AC	Sediment	01/28/16
15	JF-LTR-15-0-60cm-160127MS	AVM7AMS	Sediment	01/27/16
16	JF-LTR-15-0-60cm-160127MSD	AVM7AMSD	Sediment	01/27/16
17	JF-LTR-15-0-60cm-160127DUP	AVM7ADUP	Sediment	01/27/16

SDG	#: 36090A6 VALIDATION COMPLETEN #: AVM7/15T001-120 Level III ratory: Analytical Resources, Inc./Materials Testing & Consult	: T R 2nd R	Date: 3/24/16 Page: 2 of 2 Reviewer: 4 Reviewer: 4				
MET	METHOD: (Analyte) Grain Size (PSEP Method), TOC (Plumb), Total Solids (SM 2540G), Specific Gravity (ASTMD854)						
	Client ID	Lab ID	Matrix	Date			
18	JF-LTR-9-32-60cm-160128DUP	AVM7EDUP	Sediment	01/28/16			
19	JF-LTR-9-32-60cm-160128TRP	AVM7ETRP	Sediment	01/28/16			
20	AITRP						
21							
22							
23_ Note:	Notes:						

LDC #: 36090A6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer: \(\sum_{\text{\color}} \)

All circled methods are applicable to each sample.

Sample ID	Parameter
1-14	ph TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ AIK CN NH ₃ TKN(TOQ Cr6+ CIO ₄ $(TS)(GS)(SG)$
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
QCIS	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
TX	pH TDS CLF NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
17	pH TDS CLF NO $_3$ NO $_2$ SO $_4$ O-PO $_4$ Alk CN NH $_3$ TKN TOC Cr6+ ClO $_4$ ()
15	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4 (G)
19	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4 (GS)
70	PH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN (TOC) Cr6+ CIO
	pH TDS CI F NO ₃ NO ₂ SO ₄ O-PO ₄ Alk CN NH ₃ TKN TOC Cr6+ ClO ₄
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CI F NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ CIO4
	pH TDS CLF NO3 NO2 SO4 O-PO4 AIK CN NH3 TKN TOC Cr6+ ClO4
	pH TDS CLF NO $_3$ NO $_2$ SO $_4$ O-PO $_4$ Alk CN NH $_3$ TKN TOC Cr6+ ClO $_4$
	pH_TDS_CLE_NO ₂ _NO ₂ _SO ₄ _O-PO ₄ _Alk_CN_NH ₂ _TKN_TOC_Cr6+_ClO ₄

Comments:		 	 	 ···	
	<u> </u>	 	 	 	

LDC#: 36090A6

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: of Neviewer: 2nd Reviewer:

Inorganics, Method See Cover

	Concentr		
Analyte	6	7	RPD
Total organic carbon (%)	0.026	0.022	17
Total Solids (%)	96.52	96.74	0
Specific Gravity	2.83	2.83	0

	Percent Finer Than t			
Sieve Size (microns)	6	7	RPD	
#4 (4750)	32.1	26.9	18	
#10 (2000)	1.8	1.0	57	
#18 (1000)	1.2	0.3	120	
#35 (500)	1.1	0.2	138	
#60 (250)	1.1	0.2	138	
#120 (125)	1.1	0.2	138	
#230 (63)	1.0	0.2	133	

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\36090A6.wpd

LDC #: 36090

EDD POPULATION COMPLETENESS WORKSHEET

Anchor

Date: 3.24.	16
Page: 1 of 1	
2 nd Reviewer:	

The LDC job number listed above was entered by

	EDD Process	Y/N	Init	Comments/Action
I.	EDD Completeness	-		
la.	- All methods present?	1		
lb.	- All samples present/match report?	1		
Ic.	- All reported analytes present?	1		
Id	-10% verification of EDD?	/		
	Part of the second seco			
II.	EDD Preparation/Entry			
lla.	- QC Level applied? (EPAStage2B or EPAStage4)	1		
llb.	- Laboratory EMPC qualified results qualified (J with reason code 23)?	NA		
		9		
111.	Reasonableness Checks	-		
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	N#		
IIIb.	- Do all qualified detect results have detect qualifier (i.e. J)?	/		
IIIc.	- If reason codes used, do all qualified results have reason code field populated, and vice versa?	✓		
IIId.	- Do blank concentrations in report match EDD, where data was qualified due to blank?	/		
IIIe.	- Were any results reported above calibration range? If so, were results qualified appropriately?	MA		
IIIf.	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	1		
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	M4		
IIIh.	- Is the detect flag set to "N" for all "U" qualified blank results?			

Notes:	<u>^see readi</u>	<u>ne</u>	 		 	 	

			 		 -		
	*		 		 	 	

The attached zipped file contains two files:

File 1) Readme_Jorgensen_032416.doc	Format MS Word 2003	<u>Description</u> A "Readme" file (this document).
2) LDC AVM7 20160324.xlsx	MS Excel 2007	A spreadsheet for the following SDG(s): AVM7 36090A

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.



LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Anchor QEA, LLC 720 Olive Way, Suite 900 Seattle, WA 98101 ATTN: Ms. Cindy Fields March 30, 2016

SUBJECT: Jorgensen Forge EAA, Data Validation

Dear Ms. Fields,

Enclosed is the final validation report for the fractions listed below. This SDG was received on March 18, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #36118:

SDG # Fraction

AVS5 Polychlorinated Biphenyls, Metals

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area, September 2015
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Method Data Review, October 1999
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Christina Rink

Sincerely,

Project Manager/Chemist

	HC 1 WEEK TAT - no surcharge (Moved from 36048B) Attachment 1																																				
	EDD Stage 2B LDC #36118 (Anchor Environmental-Seattle WA / Jorgensen Forge EAA)																																				
LDC	SDG#	DATE REC'D	(3) DATE DUE	PC (808	:Bs 82A)	Me (60 /70	20A																														
Matrix	: Water/Sedimen	t i e		W	s	W	s	W	s	w	s	W	S	W	s	W	s	W	s	W	S	w	S	W	S	W	S	W	S	W	s	W	S	w	S	W	s
Α	AVS5	03/18/16	03/25/16	1	0	1	0																														
		ļ	ļ							_												<u></u>															
									<u> </u>			<u> </u>				Ш																\bigsqcup	\square		Ш	<u> </u>	<u> </u>
 																								<u> </u>											Ш	<u> </u>	<u> </u>
 				<u> </u>	<u> </u>	<u> </u>	<u> </u>			_		_				$\sqsubseteq \mid$									<u> </u>								\bigsqcup			<u> </u>	
				-	-	-	\vdash			<u> </u>		-				\square			ļ				_	ļ	<u> </u>						ļ		$\vdash \vdash$	\square		<u> </u>	
				\vdash	\vdash	-	-	<u> </u>			_					$\vdash\vdash$																	$\vdash \vdash$		\vdash	\vdash	\vdash
\Vdash				\vdash	\vdash		\vdash					\vdash				$\vdash\vdash$						_	<u> </u>		\vdash				-			$\vdash \vdash$	$\vdash \vdash$	\vdash	$\vdash\vdash$	\vdash	\vdash
\Vdash				-	\vdash	╫	 		┢			 		├─		\vdash									-				 			\vdash	H		$\vdash\vdash$		\vdash
			·	-	╁											$\vdash \vdash$																		\vdash	$\vdash \vdash$	_	-
					\vdash	 	 	ļ	_					_		-																\square		H			\vdash
				<u> </u>								<u> </u>																							\square		一
													-																						П		
				1																															П		
																				<u> </u>																	
					<u> </u>	_	┖																											Ш		L	
				ļ		ļ	<u> </u>		<u> </u>								<u> </u>						<u> </u>					<u> </u>				\bigsqcup		Ш	igsqcut		<u> </u>
						<u> </u>	_	ļ	_	_					<u> </u>																	<u> </u>		Ш	Ш	<u> </u>	
				1	1	-	₽	_	-						 	ļ	_			<u> </u>	ļ												<u> </u>			<u> </u>	\vdash
 						<u> </u>	_	┞					ļ				_				_	_		ļ					_			\vdash		\square		<u> </u>	▙
╟┼			-	╂-	 	-	-	├—	-	-	 		_			igspace	<u> </u>	ļ	-	_									_	<u> </u>		 		$\vdash \vdash$	$\vdash \vdash$	\vdash	\vdash
			-	+	1	+		\vdash							-	<u> </u>	_							 		 			<u> </u>	<u> </u>		\vdash		\vdash			-
$\ - \ $		-		+	\vdash	\vdash	\vdash	\vdash			-	1	\vdash		<u> </u>					\vdash						-			<u> </u>	├	_	\vdash		$\vdash\vdash$		\vdash	\vdash
$\ - \ $				+	+	\vdash	1	\vdash					\vdash		┢一	 		\vdash		\vdash		\vdash		\vdash		 				_		H	\vdash	\vdash	\vdash	 	\vdash
		 		+	+			\vdash					\vdash	\vdash	\vdash	\vdash									_					\vdash	 		\vdash	$\vdash \vdash$	\vdash		\vdash
╟─┤		1				\vdash	\vdash	\vdash		 			\vdash	 	 	\vdash									 	 			 			H	\vdash	$\vdash \vdash$	Н	<u> </u>	<u> </u>
					1								T	<u> </u>	<u> </u>								<u> </u>									H	H				
Total	T/CR			1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

Jorgensen Forge Early Action Area

LDC Report Date:

March 29, 2016

Parameters:

Polychlorinated Biphenyls

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AVS5

	Laboratory Sample		Collection
Sample Identification	Identification	Matrix	Date
JF-Rinsate-V-160201	AVS5A	Water	02/01/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and modified outlines of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008) and USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (October 1999). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Polychlorinated Biphenyls (PCBs) by Environmental Protection Agency (EPA) SW 846 Method 8082A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

2.17

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample JF-Rinsate-V-160201 was identified as a rinsate. No contaminants were found.

VI. Surrogates/Internal Standards

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

All internal standard areas and retention times were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
JF-Rinsate-V-160201	All TCL compounds	R	А

Due to a laboratory error, JF-Rinsate-V-160201 had a reporting limit of 0.10 ug/L. The laboratory re-extracted and analyzed JF-Rinsate-V-160201 in SDG AWE4 to achieve a reporting limit of 0.01 ug/L.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Data Qualification Summary - SDG AVS5

Sample	Compound	Flag	A or P	Reason
JF-Rinsate-V-160201	All TCL compounds	R	А	Overall assessment of data

Jorgensen Forge Early Action Area Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG AVS5

No Sample Data Qualified in this SDG

36118A	
LDC #: <u>~36048B3b</u>	

VALIDATION COMPLETENESS WORKSHEET

SDG #: AVS5 Laboratory: Analytical Resources, Inc. Stage 2B

Reviewer: 2nd Reviewerz

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Sample receipt/Technical holding times	A/A	
II.	Initial calibration/ICV	4.4	2/0 psp/101 ≤ 20 cd ≤ 20
III.	Continuing calibration	A	(cd = 20)
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	R= 1
VI.	Surrogate spikes //>	Δ	
VII.	Matrix spike/Matrix spike duplicates	1	ac sampu
Vill.	Laboratory control samples	A	w
IX.	Field duplicates	N	
X.	Compound quantitation/RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII	Overall assessment of data	A	

Note: A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank

OTHER:

Client ID	Lab ID	Matrix	Date
JF-Rinsate-V-160201	AVS5A	Water	02/01/16
0			
1			
2			

MB - 021116

L:\Anchor\Jorgensen\36048B3bW.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: Jorgens

Jorgensen Forge Early Action Area

LDC Report Date:

March 29, 2016

Parameters:

Metals

Validation Level:

Stage 2B

Laboratory:

Analytical Resources, Inc.

Sample Delivery Group (SDG): AVS5

	Laboratory Sample	B# - 4*	Collection
Sample Identification	Identification	Matrix	Date
JF-Rinsate-V-160201	AVS5A	Water	02/01/16
JF-Rinsate-V-160201MS	AVS5AMS	Water	02/01/16
JF-Rinsate-V-160201DUP	AVS5ADUP	Water	02/01/16

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with Attachment 1 of the Quality Assurance Project Plan, Addendum No. 2 to the Operations, Monitoring, and Maintenance Plan for Jorgensen Forge Early Action Area (September 2015) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (October 2004). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Arsenic, Cadmium, Chromium, Copper, Lead, Silver, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A Mercury by EPA SW 846 Method 7470A

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Cadmium Chromium Copper Silver	0.010 ug/L 0.12 ug/L 0.040 ug/L 0.010 ug/L	All samples in SDG AVS5

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JF-Rinsate-V-160201	Cadmium	0.010 ug/L	0.010U ug/L
	Chromium	0.6 ug/L	0.6U ug/L

VI. Field Blanks

Sample JF-Rinsate-V-160201 was identified as a rinsate. No contaminants were found with the following exceptions:

Blank ID	Analyte	Concentration (ug/L)
JF-Rinsate-V-160201	Arsenic Cadmium Chromium Copper Lead Zinc	0.03 0.010 0.6 0.7 0.050 0.83

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

No field duplicates were identified in this SDG.

XII. Internal Standards (ICP-MS)

Internal standards data were not reviewed for Stage 2B validation.

XIII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

Jorgensen Forge Early Action Area Metals - Data Qualification Summary - SDG AVS5

No Sample Data Qualified in this SDG

Jorgensen Forge Early Action Area Metals - Laboratory Blank Data Qualification Summary - SDG AVS5

Sample	Sample Analyte		A or P
JF-Rinsate-V-160201	Cadmium Chromium	0.010U ug/L 0.6U ug/L	А

	361189	
LDC #:_	-36046 B4a	

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

SDG #:__AVS5 Laboratory: Analytical Resources, Inc.

Reviewer: MG 2nd Reviewer:

Date: 3-21-16

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Sample receipt/Technical holding times	_ A	
II.	ICP/MS Tune	À	
111.	Instrument Calibration	Α	
IV.	ICP Interference Check Sample (ICS) Analysis	_A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	R=1
VII.	Matrix Spike/Matrix Spike Duplicates	Α	MS
VIII.	Duplicate sample analysis	Α	DUP CU OK by difference not performed
IX.	Serial Dilution	2	not performed
Х.	Laboratory control samples	A	LCS
XI.	Field Duplicates	2	
XII.	Internal Standard (ICP-MS)	7	not reviewed for Stage 2B
XIII.	Sample Result Verification	N	Ü
XIV	Overall Assessment of Data	Α	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank SB=Source blank

OTHER:

	Client ID	Lab ID	Matrix	Date
1	JF-Rinsate-V-160201	AVS5A	Water	02/01/16
2	JF-Rinsate-V-160201MS	AVS5AMS	Water	02/01/16
3	JF-Rinsate-V-160201DUP	AVS5ADUP	Water	02/01/16
4				
5				
6				
7				
8				
9				
10				
11				
12				
13	PBW			

Notes:	 	 	

36116A LDC#<u>360488</u>4a

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	of(_
Reviewer:	MG
2nd reviewer:	a

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
l	W	AI, Sb(As)Ba, Be(Cd)Ca(Cr)Co.(Cu) Fe,(Pb)Mg, Mn,(Hg)Ni, K, Se,(Ag)Na, TI, V,(Zn)Mo, B, Si, CN ⁻ ,
QC 2,3	<u> </u>	Al, Sb.(As)Ba, Be,(Cd) Ca(Cr) Co,(Cu)Fe(Pb) Mg, Mn(Hg) Ni, K, Se(Ag) Na, Tl, V(Zn) Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
	_	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
	-	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
	·	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
	1	Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
ICP-MS	W	Al, Sb.(As.)Ba, Be,(Cd.)Ca(Cr.) Co(Cu) Fe(Pb) Mg, Mn, Hg, Ni, K, Se,(Ag) Na, Tl, V,(Zn) Mo, B, Si, CN ⁻ ,
GEAA J		Al, Sh, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Ph, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻

Comments: Mercury by CVAA if performed	

LDC #: 36048B4a SDG #: See Cover

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA

Page:	lofl
Reviewer:	MG
2nd Reviewer:	a

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: ug/L

Associated Samples: all

	yattavi irek			100		See 1		1300		
Analyte	Maximum PB ^a (mg/Kg)	Maximum PB ^a (ug/L)	Maximum ICB/CCB ^a (ug/L)		1					
Cd		0.010		0.050	0.010					
Cr		0.12		0.60	0.6					
Cu		0.040		0.200						
Ag		0.010		0.050						

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

2616A LDC#<u>36048</u>B4a

VALIDATION FINDINGS WORKSHEET Field Blanks

Page:_	of
Reviewer:	MG
2nd reviewer:_	

METHOD: Tra	ace Metals (EPA SW 846 Method 6010/6020/7000)	
ÝN N/A ÝN N/A	Were field blanks identified in this SDG? Were target analytes detected in the field blanks?	
Sample:	Field Blank / Trip Blank (Rinsate) Other	_(circle one)
	Analyte.	Concentration Units (
	As	0.03 (Mg/L)
	Cd	0.010 ()
	Cr	0.6
	Си	0.7
	<u>Pb</u>	0.050 ()
	Zn	0.83 (1)
Sample:	Field Blank / Trip Blank / Rinsate / Other	(circle one)
	Analyte	Concentration Units ()

LDC #: 76048 3618 EDD POPULATION COMPLETENESS WORKSHEET
Anchor

Date: 3.25-/ 6

The LDC job number listed above was entered by

Anchor Page: 1 of 1

2nd Reviewer:

1.	EDD Process	V//\		
l. (Y/N	Init	Comments/Action
	EDD Completeness			
la.	- All methods present?	\	@	
lb.	- All samples present/match report?	1	W	
lc.	- All reported analytes present?	1	(1)	
ld -	-10% verification of EDD?	\	(7)	
11.	EDD Preparation/Entry	- ,		
IIa.	- QC Level applied? (EPAStage2B or EPAStage4)	/	0	
	- Laboratory EMPC qualified results qualified (J with reason code 23)?	Na	4	
111.	Reasonableness Checks	_		
IIIa.	- Do all qualified ND results have ND qualifier (i.e. UJ)?	Ma		
	- Do all qualified detect results have detect qualifier (i.e. J)?		4	
	If reason codes used, do all qualified results have reason code field populated, and vice versa?	✓	0	
	- Do blank concentrations in report match EDD, where data was qualified due to blank?	/	W	
	- Were any results reported above calibration range? If so, were results qualified appropriately?	Na	Q.	
	- Are all results marked reportable "Yes" unless rejected for overall assessment in the data validation report?	√	(v)	
IIIg.	-Are there any lab "R" qualified data? / Are the entry columns blank for these results?	1, 1	V	
	- Is the detect flag set to "N" for all "U" qualified blank results?	1	6	

Notes <u>:</u> _	*see readme	 	 	 	
				 	_

36048B

The attached zipped file contains two files:

<u>File</u>

1) Readme_Jorgensen_032516.doc	MS Word 2003	A "Readme" file (this	s document).
	MS Excel 2007	A spreadsheet for the	
2) LDC36048 AVR0 AVS5 VEDD 2	20160324.xlsx	AVR0	36048A

Description

AVS5

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Christina Rink at (760) 827-1100 if you have any questions regarding this electronic data submittal.

Format